# THE BRICKBVILDER

AN ARCHITECTVRAL MONTHLY

VOLVME XXII — NOVEMBER 1913 — NVMBER 11


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*Photo by the Royal Prussian Photometric Institute.*

**CHURCH OF THE KAPNIKAREA, ATHENS, GREECE**

Typical of the scores of individual shrines built at Athens from the ninth to the thirteenth centuries. Façades of common brick and Peiraic yellow sandstone.

# THE BRICKBVILDER

NOVEMBER, 1913

VOLVME XXII. NVMBER 11.


## A Discussion of the Design and Purpose of Mouldings.

ACCOMPANIED BY A SELECTION OF REPRODUCTIONS FROM OLD HANDBOOKS USED BY COLONIAL BUILDERS.

BY AYMAR EMBURY, II.

FOR the purposes of this article only mouldings used in styles of architecture which employ the orders will be discussed, since the inclusion of Gothic and perhaps other styles would necessarily expand the article far beyond the limits assigned, and one might add that the variations of Classic forms of various periods of the past open a wide enough field for any one article.

At the outset one finds that those styles which we are accustomed to designate as "pure" or "simple" contain much more complicated mouldings than those of the more florid styles. I suppose this is natural enough, since a style which depends upon decoration of surfaces for its interest does not require the intelligent consideration of detail which is demanded in a building where the forms depend upon their naked proportions for effect. Thus we find unusual and interesting curves in Greek mouldings where the Romans used curves which could be formed to a radius, and we find in the American Colonial, mouldings of greatly superior interest to any of the French school. Of course a surface covered with plastic decoration presents a variety of shadows which can only be bounded and limited by the shadows cast from bold and simple mouldings; delicate play of light and shadow, and refinement of mouldings, would be more or less wasted, whereas with plain surfaces and simpler orders, the enrichment of the shadows by minute gradations and unexpected blacks is the only method of relief and of providing sympathetic interest. One other reason occurs to mind as being the possible cause of superiority of interest in the mouldings of the Greek and Colonial architects over those of the rest of the designers in Classic forms, and that is, in both cases the design was more or less spontaneous and not fixed and regulated by example.

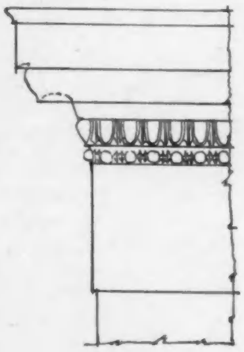


FIG. I.

Greek Pilaster Cap from the Parthenon.

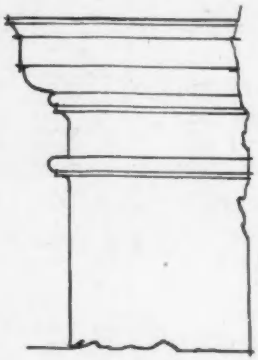


FIG. II.

Roman Pilaster Cap from Vignola, after Vitruvius.

When Vitruvius produced his work on the orders he probably did a very useful thing, but it is also largely due to the canons that he established that design came to be more or less of a formula where minute differences in proportion were accepted as evidences of originality, instead of really permitting free play to the imaginations of the designers. The Greeks, of course, had no such formulæ and we find an extremely wide variation between the orders of the various buildings; some of them, perhaps, very bad, but none commonplace, while the Roman work approaches much more nearly a standard of proportions.

From the time of the Renaissance until to-day, with some minor exceptions, including the designers of the American Colonial work, a not dissimilar condition has existed; we have Vignola's excellent book, which treats the orders in the same way that the manufacturers of office partitions advertise their products, "made by the mile, sold by the foot, suitable to all locations." During the Colonial period of this country, the freedom from tradition, or, if you like, the ignorance of the designers, compelled them to use their brains and in consequence they designed with a freshness and virility which has not been since equaled, and which, if we stick to Vignola, will not probably be equaled very soon. Let us compare some specific instances of the various schools.

The section of an impost cap in the Parthenon does not contain a moulding which could possibly be formed with a compass, and the succession of mouldings is curious and not obviously desirable; yet the play of light and shadow on the surfaces makes it as interesting as it is unusual (Fig. I). Compare this with the Roman Doric pilaster cap; this has no undercuts, and each moulding is formed to a radius. We perceive at once that this (Fig. II) is good architecture; in fact, we know it is good architecture because we were brought up on it; it is from Vignola. It is very likely that if this were the only capital of its kind in the world it might even be interesting architecture, but eleven million pilasters in all parts of the civilized world, on all sizes, shapes, and kinds of buildings and in all sorts of materials, have exactly the same succession of mouldings and the same proportion. The Parthenon cap is the more interesting, not only because it was unusual, but because it was designed to fit a particular place, under particular lighting conditions and for a particular material.

Of course it was not uncommon in Renaissance times to

find series of mouldings which had strong personalities of their own, but these were usually more or less ignorant copies (not adaptations) of Classic architecture that were gotten out of books, flavored with reminiscences of Gothic. It was interesting design; but not very often of the quality likely to convince one that it pays to be different. Of such a type is the dormer window of the Choir House at Salisbury (Fig. III). It is like a good deal of English work, extremely picturesque, but perhaps not very well studied; and how much work there is that is not well studied! I believe that most draftsmen, and a good many architects, including myself, do not go about the study of mouldings in the correct manner; we have formed the habit of studying them a certain way, and we keep on in spite of a moral conviction that it is not the right way. We study them in section with the chief end of getting an agreeable succession of curves and plain surfaces, and with special tenderness for making the curves themselves beautiful. Now this method may apply very well to the design of Art Nouveau surface treatment, but it is certainly not the correct way in which to study a cornice, and if we do get good cornices it is only because either we or those from whom we copy have by experiment found that a certain projection and scale of detail will arrive at somewhere near the right result — but only somewhere near.

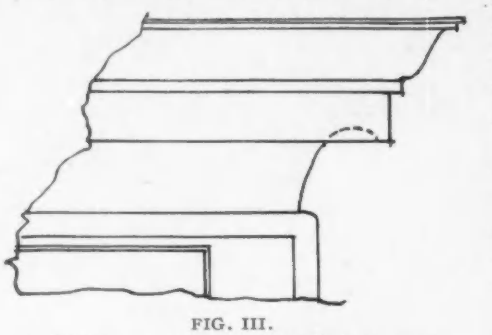


FIG. III.
English Dormer Cornice. The Choir House at Salisbury, from "The Practical Exemplar of Architecture."

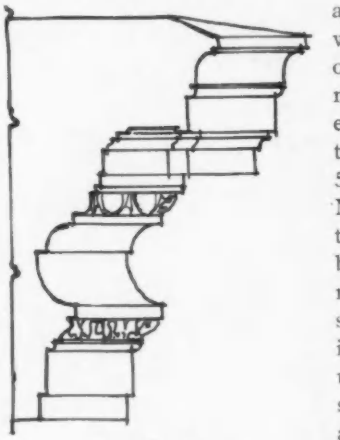


FIG. IV.
Entablature for Exterior Use.
McKim, Mead & White, Architects.
From Snyder's "Building Details."

Mouldings are seen in only two ways: one in which it is not the profile that counts but the shadows of the surfaces and the shades caused by their arrises; the other where they turn a corner and we see them in profile. This profile is *not* the profile we have studied with so much care, but is a diagonal of that profile and presents a very different succession of curves; and neither of these two ways of seeing a series of mouldings or a cornice is as a rule correctly considered. I have seen a draftsman, a tremendously clever and highly paid man too, spend three days in studying the cima of a cornice on one of the New York public buildings and no one of the several hundred lines that he drew was different in height or projection, differing only in the curve; and certainly two and a half days of that study was wasted. He occasionally did rub on some shadows, but he always considered these shadows as being cast on the diagonal of a cube, a condition which would, of course, on some buildings sometimes occur, but he did not take into consideration the fact that the façade he was studying faced north, and only the brief returns could ever have such shadows. This particular cornice should have been studied for its profiles, and, if for shadows at all, for those thrown by reflected light. I do not think either that this is an extreme case, but a very ordinary illustration of the way we work in design, because we are so tied up with the formulæ from Vignola we have been trained in. I have observed also that not a few men will go about the design of an interior cornice in the same manner that they would for one to be used on the exterior of a building.

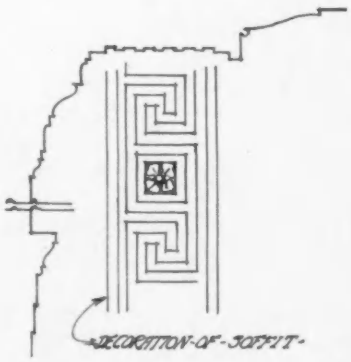
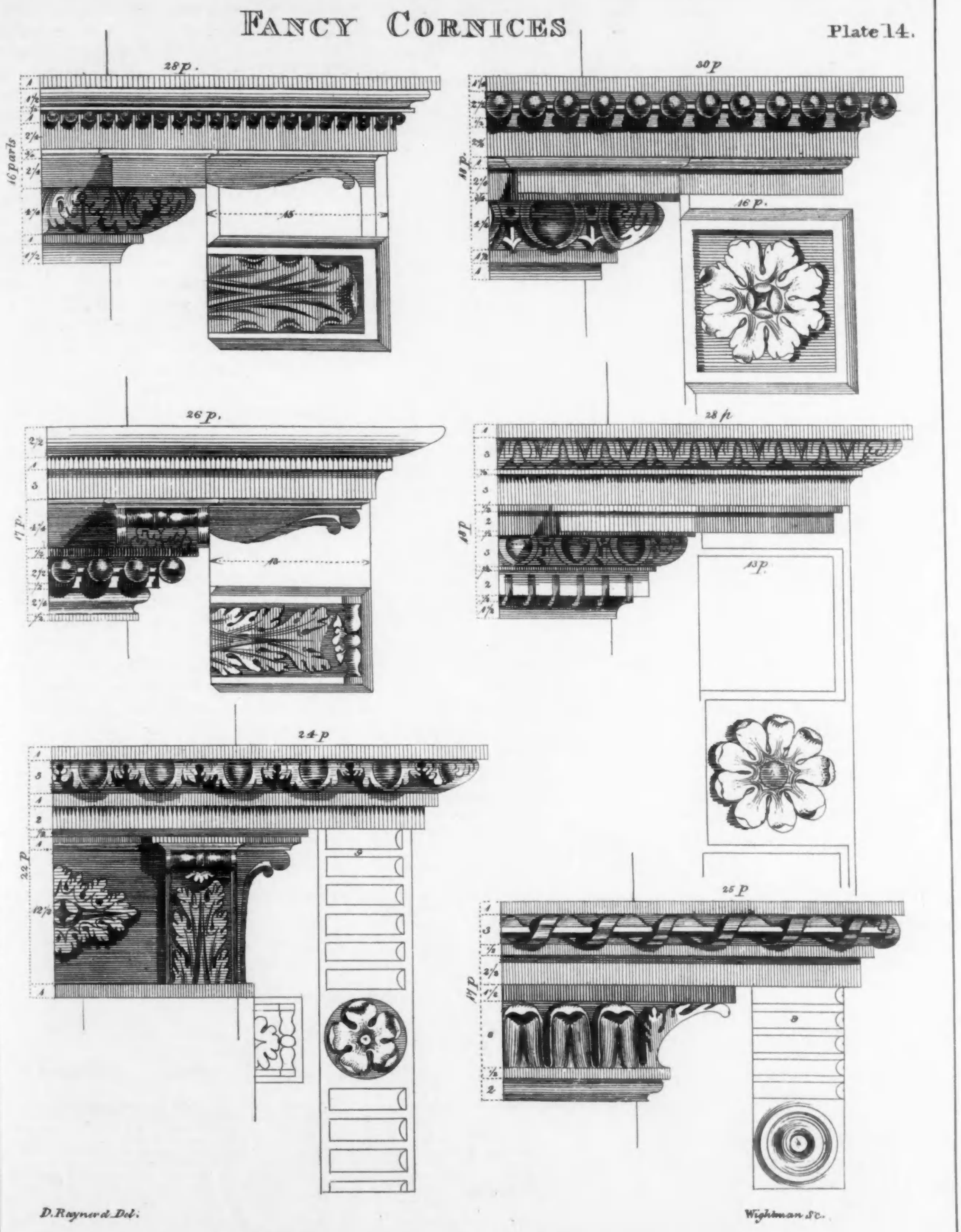



FIG. V.
Interior Entablature.
McKim, Mead & White, Architects.

Now as exterior cornices in their more or less standardized form represent a sort of consensus of opinion as to the succession of curves and flat surfaces which produce agreeable shadows with the light from *above* and thereby form a pleasing termination to a motive, it is impossible that the same combination of mouldings would form an equally successful termination to the wall when lighted from below. Some of our architects have been quick to recognize this, while others have not. As good examples, compare the porch cornice for the entablature of a city house in West 54th street (Fig. IV), designed by McKim, Mead & White, with the interior cornice of the Charles Dana Gibson house (Fig. V) by the same architects, in both of which material and position have been duly considered. The exterior cornice is executed in marble so that sharp mouldings and undercuts are practicable, but as the intersections of this cornice form an exterior angle the cima is snubbed and the projection of the corona very greatly reduced; the cornice has been designed for its diagonal profile, and in place of a single deep shadow from the corona we have a variety of smaller and very interesting shadows cast by the extremely rich bed mouldings, only one of which is decorated. In the interior cornice the depth of the corona from the ceiling is reduced to the utmost limit of what is possible; the cima is extended far beyond the usual projection since it no longer casts a shadow but becomes an intermediate member between the ceiling and the cornice. The soffit is ornamented with a sort of Greek fret; it is no longer a soffit, but a decorative band around the ceiling, and certain of the mouldings are accentuated to give not shadows, but high lights.

One of the most interesting and inspiring books that I have come across in a long time is one called "The American Builders' Companion; or a New System of Architecture Particularly Adapted to the Present Style of Building," by Asher Benjamin, an architect of the days just succeeding the Revolution. He was successful, not only as a designer but as a publisher of a




FROM ASHER BENJAMIN'S "AMERICAN BUILDERS' COMPANION"
ILLUSTRATING INTERIOR CORNICES

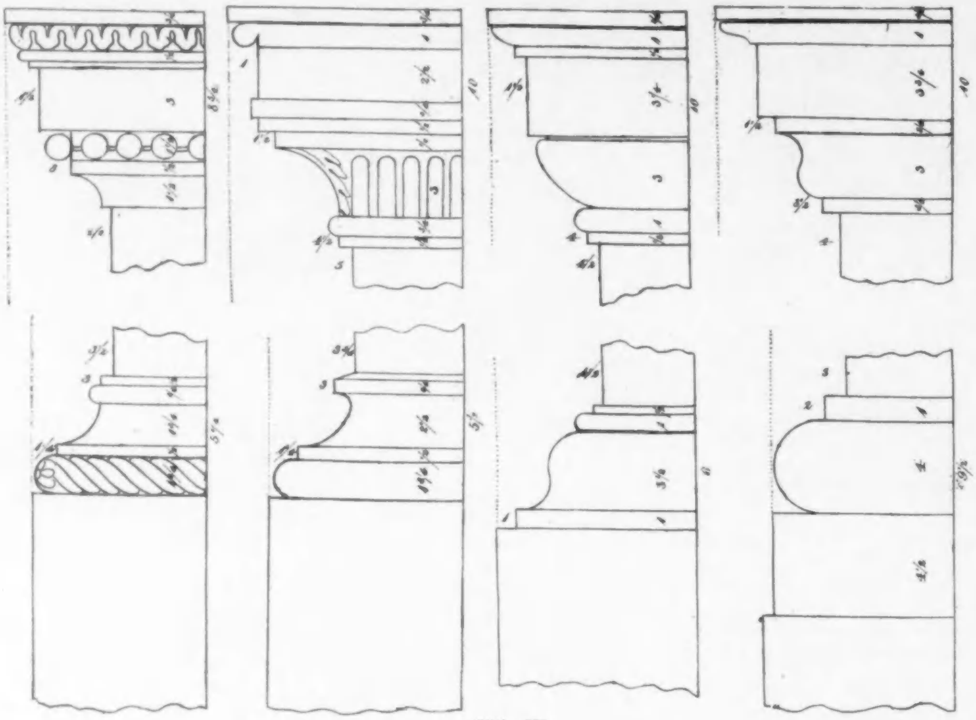


FIG. VI.
Pilaster Capitals and Bases. From Asher Benjamin's "American Builders' Companion."

series of very excellent handbooks which instructed the carpenters of that day how to go about their design, and one finds in his books many of the most interesting mouldings of what we call Colonial architecture; but what is especially useful to us to-day is the very wide departure from Classic forms which he shows, in spite of the fact that he was familiar with Palladio's orders, and includes a series of plates (Fig. VI), following them in a general way, except that he makes his columns — Doric, Ionic, and Corinthian — ten, eleven, and twelve diameters high, respectively, instead of the conventional eight, nine, and ten. The entablatures, however, follow quite closely the Classic variation of parts, but when in the body of his book he comes to illustrate series of cornices (Figs. VII and IX) or architrave mouldings (Fig. VIII) suitable for every-day use they have a very different air. One finds in his interior cornices the same theory expressed which McKim, Mead & White have used in the cornice in the Gibson house; the cima no longer appears as such, and the soffit of the cornice is widely extended and decorated to form a band around the ceiling rather than a device for casting shadows. The exterior cornices also are very far from being Classic, but those who have seen some of the lovely old buildings in Litchfield, Conn., Greenfield, Mass., and Bennington, Vt., and have recognized in them Asher Benjamin's motives, realize that one can form an agreeable termination to a building without adhering very closely to Classic formulæ.

It will be argued that these varied and light mouldings are adapted to wooden architecture only and unsuitable to monumental buildings, but this is something which can hardly be decided offhand since, in this country at least, they have never been tried; on the other hand, the Greek is the most monumental architecture which has ever been devised, and in that we find the same freedom of treatment of cornice and moulded members that exists in the Colonial.

The question of material of which cornices are composed also will be found to have a very great effect upon the design; the terrific expense of cutting granite makes it practically impossible to use either complicated or under-

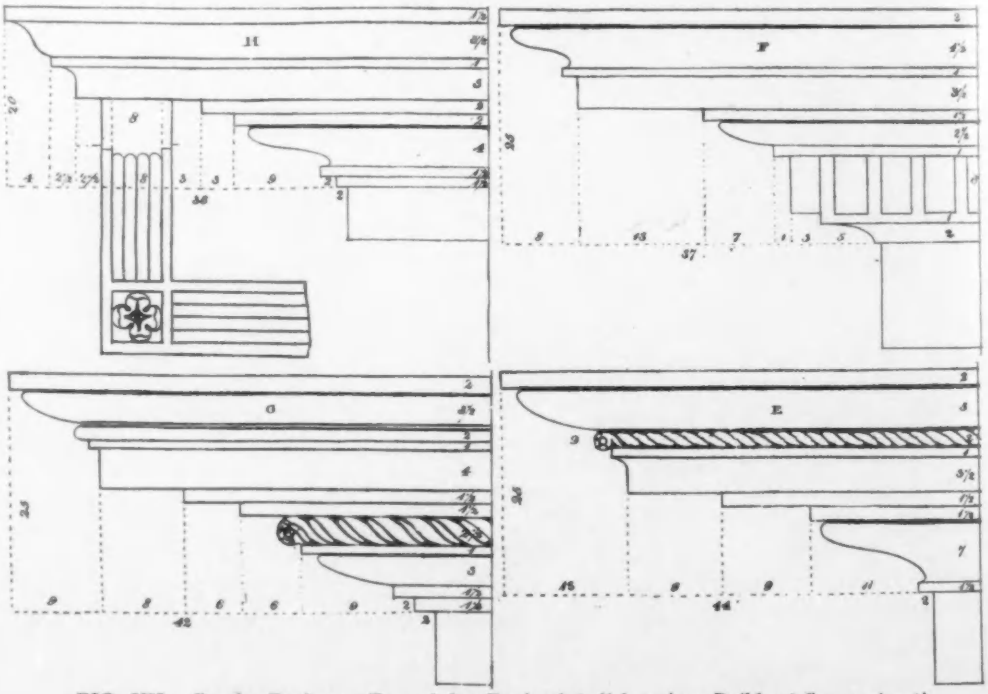



FIG. VII. Cornice Designs. From Asher Benjamin's "American Builders' Companion."

cut mouldings in this material. In marble, however, considerable variety can be obtained; the same thing is to some extent the case in limestone, although the material is not quite as resistant as marble, but when we come to the more workable materials, such as wood and terra cotta, there seems to be no reason in the world for sticking to stereotyped architecture except a lack of courage and ability to design, and also the human instinct to follow along well-trodden paths.

Without wishing to express an opinion on the merits of either piece of design, I might say that a comparison of the two very well-known buildings, the New York Customs House, by Cass Gilbert, and the State Educational Building, by Palmer, Hornbostel & Jones, illustrates very well how the two materials should be used and that both methods will adequately crown a monumental order. Mr. Gilbert in the Customs House has a granite cornice which contains no angle of less than 90 degrees between surfaces, and in which the projections are reduced to the utmost to make cutting as simple as possible. In the State Educational Building Mr. Hornbostel, with characteristic daring, has designed what is perhaps the most original example of cornice treatment in modern times. He has certainly shown how flexible the cornice of a building is and how wide a departure may be made from traditional design without distortion of proportion.

I have spoken at some length of cornices, because of all mouldings they are the most important and the least intelligently used; there are very few of us who are able to think otherwise than in terms of Vignola.

Of the other mouldings on the exterior of buildings,

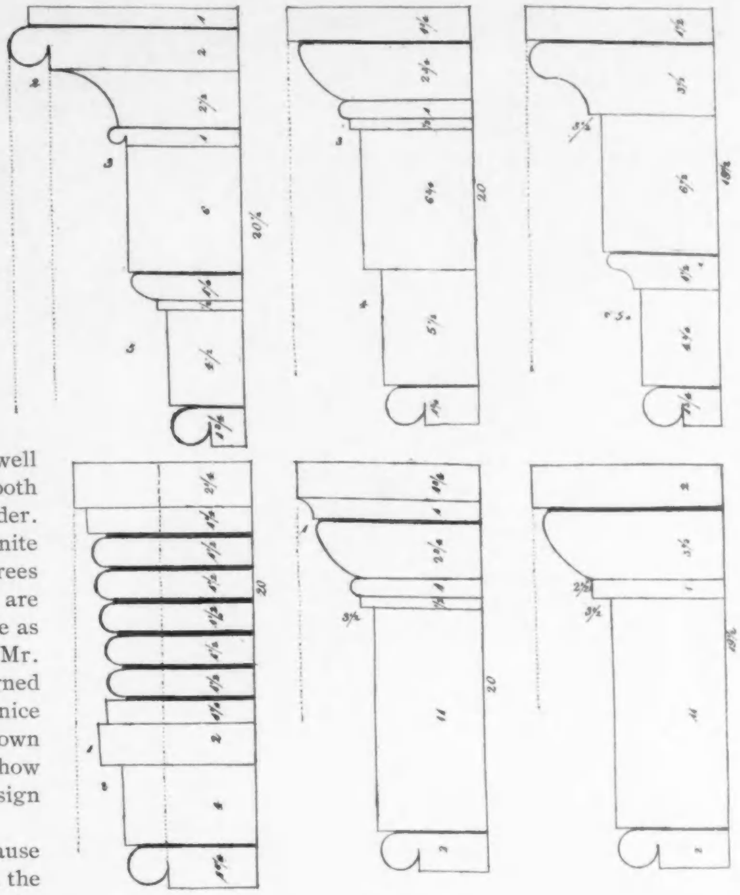


FIG. VIII.
Architrave Mouldings. From Asher Benjamin's "American Builders' Companion."

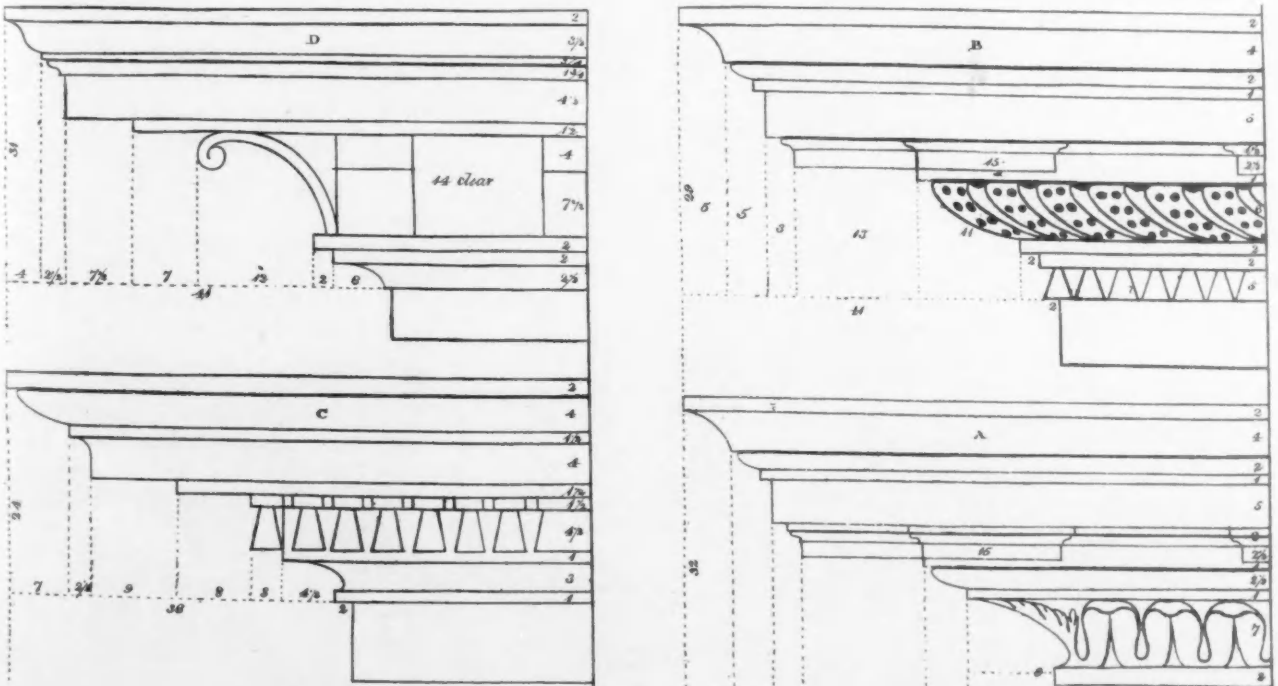



FIG. IX.
Cornice Designs. From Asher Benjamin's "American Builders' Companion."

the two most important are architrave mouldings and belt courses, and we find in most current work the same banal adaptation of the easiest thing rather than thoughtful and well-considered study. Of course if one gets a belt course approximately in scale with a façade, the result is not going to be very bad, but an approximation of correctness should not be satisfactory to a conscientious designer.

Turning again to McKim, Mead & White, we find that in the Gorham Building (Fig. XI) they have adapted a belt course, or sort of cornice, around the sixth story which is of unusually good character. Its firmness and delicacy at once strengthen and refine the lines of the building, and while the designers have manifestly made concessions to the material in which they have worked, at the same time the moulding was designed to fit its particular position and particular lighting, and was not the belt course of commerce which we find so often used, as the juxtaposition of dentil moulds and cima prove. A moulding of this kind is obviously required on a building as plain and unornamented as the Gorham Building, while, on the other hand, the very banal belt course or impost mould illustrated from Cesar Daly (Fig. X) is plenty good enough for its position, cut over by the heavily scaled console and adjoining rusticated stonework. Real refinement of moulding would be lost when contrasted with the heavy shadows and deep cuttings of the console and the sharp lines of the rustication; but here in this country even the Frenchiest of us prefer our design plainer than the French, and when we leave off the consoles and flatten the rustication, we are too apt to forget that the belt courses which were good enough under the former conditions become really stupid when the decoration is removed.

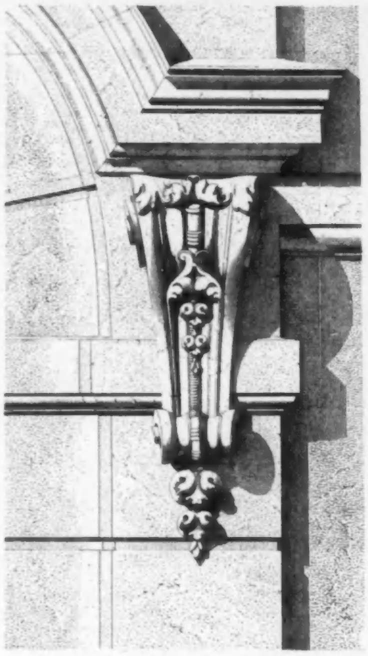


FIG. X.
Impost Mould. From "Motifs Historiques" by Cesar Daly.

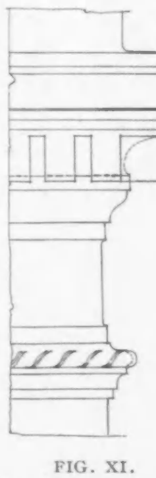


FIG. XI.
Belt Course on Gorham Building, McKim, Mead & White, Architects. From Snyder's "Building Details."

In designing window and door architraves the same methods are usually applied for both interior and exterior work, whereas the conditions of use are markedly different. I have often seen a draftsman throw his section into isometric projection, black on his shadows, and assume that the result gives him something like a fair idea of the way the architrave would appear. As a matter of fact, on interior architraves in daylight the shadows are thrown exactly in the opposite direction from the one usually assumed, and he has high lights where he has placed shadows, and no shadows at all, only shades.

If this method of designing architraves does not more often show unhappy results it is because window curtains often cover the trim and not because the mouldings themselves are well designed. Still one other thing which must be thought of as a factor in designing, and that is the settling of dust or dirt on upper surfaces, giving a shadow where one expects a high light; and this condition of affairs (while I have often heard architects speak of it) has only been considered as a factor to be reckoned with, so far as I know, by a sculptor, Mr. Tonetti, who has for this very reason distorted real forms in order that they might appear well. One often notices that the base boards around a room, especially when painted white, show black shadows where the designer expected high lights, owing to the settlement of dust perhaps even before the paint was dry, so that the dark line is ineradicable. Of course all architectural design should be a drawing on paper, not of forms which are agreeable in two dimensions, but which will appear properly in three; and I have found that the constant tendency of draftsmen, and of the architects themselves, speaking from my own experience, both as a draftsman and as head of an office, is that the paper form in evidence before one is liable to take precedence over a form which would, when executed, be the better.

Take, for example, the well-known reversed cima so frequently used in door and window casings; the form which is more agreeable to the eye is that shown in Fig. XII, but our Colonial ancestors used that shown in Fig. XIII, which in spite of a somewhat broken and hump-backed appearance executes much better since in the first case the point of shade is thrown far down on the cima, and in the other very high up; and the reason for the non-Colonial appearance of what to the architect appears to have been a carefully-designed Colonial house is the fact that the mouldings themselves are of the usual type and not those employed by the Colonial designers.

I have chosen the Colonial school for purposes of comparison in so much of this discussion because it is a type with which I am most familiar, and also because it is a style pre-eminently of unusual and lovely mouldings; but the deductions drawn from work of this school apply with equal force to all work; the moulding itself should never be considered, but its purpose and position.

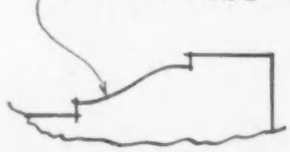



FIG. XII.
The Modern Cima.

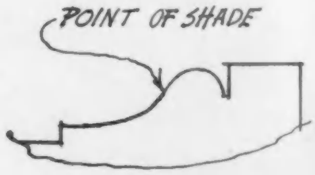



FIG. XIII.
A Colonial Cima.

# The Lighting of Public and Semi-Public Buildings.

THIRD PAPER.

ACCOMPANIED BY A SERIES OF ILLUSTRATIONS SHOWING SPECIFIC LIGHTING INSTALLATIONS.

BY L. B. MARKS,
*Consulting Illuminating Engineer, New York City.*

MUSEUMS AND ART GALLERIES. In museums and art galleries a well diffused light, irrespective of quantity, often falls short of producing satisfactory results in illumination unless the directive feature of the lighting is carefully planned. For example, statues that are evenly illuminated from all directions lose form and detail, whereas if the illumination is planned to give suitable light and shade on the objects in space the latter are seen in the proper perspective and do not appear "flat." For this reason lighting by skylights exclusively is not desirable in such portions of a museum as are devoted to the exhibition of statuary, a side light being indispensable in such cases to give proper light and shade on the objects.

In art galleries the directive value of the light is likewise of great importance. Sufficiency and thorough diffusion of the light will not of themselves give the desired results in illumination. The light sources must be so disposed that the observer will receive a minimum of specular reflection from the paintings or pictures viewed. As a rule this result can best be accomplished by limiting the area of the lighting source to a band of light situated well above and a few feet in front of the pictures to be viewed. Such a band of light should preferably consist either of a border of diffusing glass plates behind which are located individual lamps backed by reflectors, or a ceiling band indirectly illuminated, or a combination of both these methods.

FIG. VII. BROOKLYN MUSEUM OF ARTS AND SCIENCES, BROOKLYN, N. Y.

*FIG. VII shows the method of lighting the galleries of the Brooklyn Museum of Arts and Sciences, by individual drop lights, each containing a 40-watt tungsten lamp, backed by a steel reflector.*

FIG. VIII. GAS LIGHTING INSTALLATION IN THE PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART, PHILADELPHIA, PA.

*FIG. VIII shows a gas lighting installation in the Pennsylvania Museum and School of Industrial Art. Welsbach reflex burners are used in this installation, 45 degree angle shades being provided for the burners to illuminate the models at the sides of the room. For the illumination of the easels in the center of the room, reflex burners provided with steel enameled concentrating reflectors are used. By-pass individual control of the lamps is provided.*

FIG. IX. NIGHT VIEW, SHOWING SEMI-INDIRECT LIGHTING IN PHILADELPHIA ART CLUB, PHILADELPHIA, PA.

*THIS illustration is a night view of the Philadelphia Art Club, showing semi-indirect illumination by diffused and directed light. The lamps are enclosed in diffusing glassware and the illumination is derived from a band of light, extending around the room within a few feet of the walls. To make such an installation most effective, an opaque screen should be dropped from the inner edge of the reflectors, sufficient in depth to screen the eye of the observer from the direct illumination of the light diffusers.*

## LIBRARIES AND SCHOOLS.

THE design of the illumination of a public library involves considerations which are quite unlike those that ordinarily confront the illuminating engineer, and are in many respects more difficult to meet than in almost any other class of buildings. Very often economy of operation is a governing factor in the design of library illumination. In planning the lighting installations of the Carnegie branch libraries which are described herein, economy of operation was of perhaps more than usual importance as the libraries purchased electric current for lighting from the public service company at the retail rate. The aim of the design of lighting in these libraries was to secure:

(1) Sufficient illumination on the reading tables and bookshelves to meet the demands of a wide class of readers of various ages and conditions of eyesight, taking into account the fine print in some of the books and the difficulty of reading titles of books in position on the shelves. Some of the books are worn by frequent handling and the titles become more or less obscured.

(2) Low intrinsic brightness of light sources and freedom from glare, and so far as possible removal of lights from the ordinary field of vision.

(3) Sufficient illumination for the library staff to oversee the entire floor.

(4) Sufficient illumination to provide a moderate reading light in all parts of the room; to admit of the relocation or addition of furniture, such as portable magazine filing racks, etc.

(5) Moderate cost of installation.

(6) Economy of operation. This must take into account not only the system of illumination and type of lamps used, but also the switching arrangements.

(7) Simplicity in construction and convenience in operation. This must take into account the character of help in local charge of the equipment.

(8) Esthetic design of fixtures, and attractive appearance of the reading rooms at night.

FIG. X. INDIRECT LIGHTING INSTALLATION IN MILWAUKEE PUBLIC LIBRARY, MILWAUKEE, WIS.

| | |
|---|---|
| *Dimensions* | *30 x 58 ft. (central area) = 1,740 sq. ft.* |
| *Outlets* | *3* |
| *Watts, 3,600* | *Watts per square foot, 2.06* |
| *Average Foot-candles* | *5.0* |
| *Ceiling and Wall Tint* | *Light Cream* |

(NOTE.—Balcony area, 2,912 sq. ft., 16 fixtures. 1 400-watt lamp per fixture. Balcony lights add to central area lights, and central area lights add to balcony lights.

Central area units are wired on 2 circuits of 600 watts each. With half of the lights on the measured illumination was found to be twenty-five per cent less than with all lights on, or a little less than 4 foot candles, which is ample illumination.)

FIG. XI. CIRCULATING DEPARTMENT.

FIG. XII. ROOF READING ROOM.

CARNEGIE LIBRARY BUILDING, NEW YORK CITY.

*THE above illustrations are taken from a paper on the "Design of the Illumination of the New York City Carnegie Libraries," presented by the author at a meeting of the Illuminating Engineering Society, in Philadelphia, October, 1908.* In this installation, the scheme of lighting was to provide a moderate general illumination, supplemented by local lighting where required. The installation was completed before the days of the commercial tungsten lamp, but the design contemplated the future substitution of tungsten lamps for the carbon filament lamps in use.*

*Fig. XI shows the circulating department and reference room of one of the Carnegie Library Buildings. In the front of the room is the circulating department, in the middle the application and delivery desk, and in the rear portion the free standing book stacks and reference room. These departments are separated from each other by low rails or low book-shelves. Along the walls of the room are bookcases about seven feet high. The walls are cream color and the ceiling white. The public has access to all of the book-shelves. In the entrance hall are located two exhibition racks of the swing frame type. The switches for controlling the lights are in charge of the librarian. The lamps for localized illumination are connected separately from those for general illumination and are switched in when necessary to supplement the general lighting. The local lamps on low book-shelves are mounted on swinging brackets and are automatically cut out of circuit when the lamps are out of use.*

*Illumination data for this room are as follows:*

| | |
|---|---|
| *Area* | *2,950 sq. ft.* |
| *Watts, General Illumination (Carbon Filament Lamps)* | *2,316* |
| *Watts, Localized Illumination (Carbon Filament Lamps)* | *4,174* |
| *Watts per square foot (General Illum.)* | *0.78* |
| *Average Foot-candles (General Illum.) on Horizontal Working Plane* | *1.1* |
| *Average Foot-candles on Reading Tables* | *5.0* |
| *Foot-candles (Vertical) on Book-shelves* | *1½ to 4* |
| *Foot-candles (Horizontal) on Book-shelves* | *4 to 8* |

*Fig. XII shows the roof reading room of the Carnegie Library. This space is lighted by lamps enclosed in deep diffusing reflectors. The illumination is planned not to fall below an intensity of 3 foot-candles on the reading tables.*

* Trans. Illum. Eng. Soc., Vol. 3, 1908, p. 538.

FIG. XIII. AUSTIN PUBLIC LIBRARY, AUSTIN, ILL.

*Data*

| | |
|---|---|
| *Ceiling Height* | *10 ft. 9 ins.* |
| *Dimensions* | *53 x 82* |
| *Outlets* | *28* |
| *Watts, 1-250 per fixture* | *Watts per square foot, 1.6* |
| *Average Foot-candles* | *3.9* |
| *Distance to Ceiling* | *33 ins.* |

FIG. XIV. GREGG SCHOOL OF SHORTHAND, CHICAGO, ILL.

*Data*

| | |
|---|---|
| *Ceiling Height* | *11 ft. 9 ins.* |
| *Dimensions* | *28 x 38 = 1,065 sq. ft.* |
| *Outlets* | *5 (3 100-watt lamps per fixture)* |
| *Watts, 1,500* | *Watts per square foot, 1.4* |
| *Average Foot-candles* 3.3 | *Ceiling Tint, Light Yellow* |
| *Wall Tint, Medium Yellow* | *Distance to Ceiling, 30 ins.* |

FIG. XV. NIGHT VIEW, SHOWING GAS ILLUMINATION IN MERCANTILE LIBRARY, PHILADELPHIA, PA.

*FIG. XV shows a night view of the Mercantile Library, Philadelphia, illuminated throughout by gas lamps. Welsbach reflex burners are used. Green cone shades are used on the desk lights and special standards for the tables. By-pass individual control of the lights is provided. For lighting the balcony and book-shelves thereon, rows of pendent gas lamps, enclosed in 6-in. opaline globes, are used.*

*Fig. XVI shows a direct lighting installation in a library, in which the lighting is carried out by rows of 5-light chandeliers, equipped with lamps backed by individual prismatic reflectors.*

THE main features of the design of the lighting installation in these libraries are as follows :

Freedom from glare. No unshaded lamps. Intrinsic brightness of lighting sources, 1/10 of a candle-power per square inch of actual surface.

General illumination combined with localized illumination.

General illumination 1 foot-candle on horizontal working plane.

Illumination (horizontal) on reading tables, average working conditions, 5 foot-candles.

Illumination (vertical) on book-shelves 1½ to 4 foot-candles.

Illumination (horizontal) on book-shelves 4 to 8 foot-candles.

Combination of general and localized lighting designed to secure maximum illumination on the working spaces at minimum cost of operation for the required results.

Ceiling pendants for general illumination designed for efficient use of tungsten lamps.

Flexibility. Design of switching arrangements for economical use of light. Lights near windows placed on same circuits so far as possible.

Lamps for general illumination hung high, but low enough to avoid sharp contrasts on the ceiling.

Lamps for general illumination

FIG. XVI. DIRECT LIGHTING IN LIBRARY.

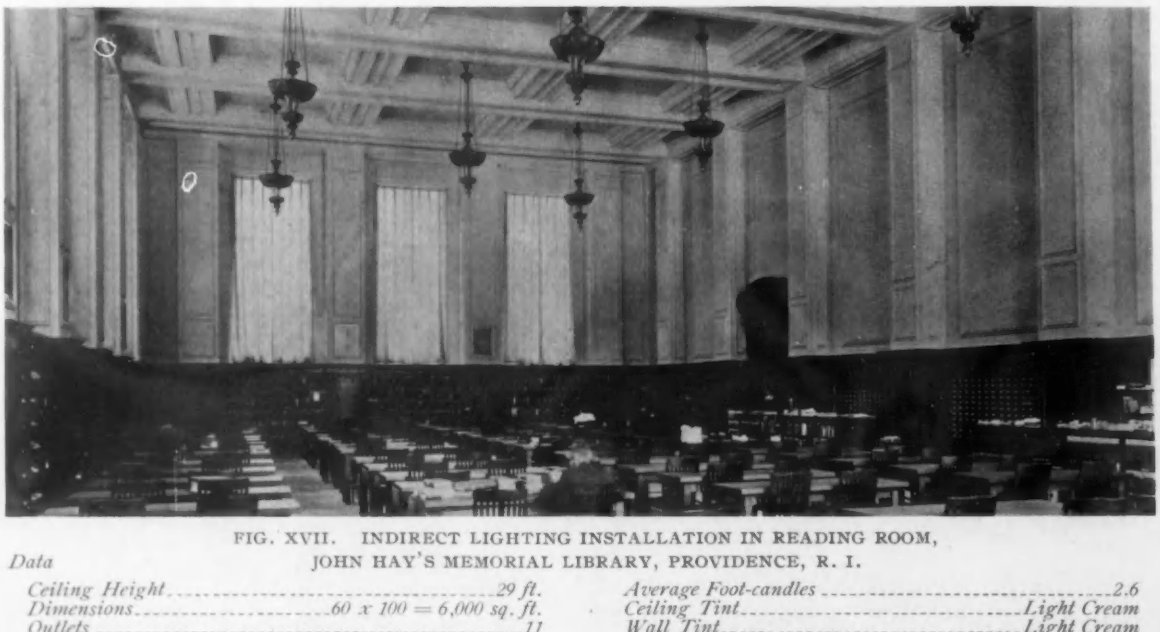


FIG. XVII. INDIRECT LIGHTING INSTALLATION IN READING ROOM, JOHN HAY'S MEMORIAL LIBRARY, PROVIDENCE, R. I.

*Data*

| | | | |
|---|---|---|---|
| *Ceiling Height* | *29 ft.* | *Average Foot-candles* | *2.6* |
| *Dimensions* | *60 x 100 = 6,000 sq. ft.* | *Ceiling Tint* | *Light Cream* |
| *Outlets* | *11* | *Wall Tint* | *Light Cream* |
| *Watts, 6,600* | *Watts per square foot, 1.1* | *Distance to Ceiling* | *8 ft.* |

(NOTE.—No bracket or reading lamps used. Furniture and tables dark. These fixtures were first made up with direct lighting attachments, so that in case the indirect was unsatisfactory, the direct light could be used. These attachments have all been removed and indirect only is used.)

enclosed in 16-inch crystal glass globes roughed on the outside.

Lamps for table lighting provided with prismatic reflectors designed to throw the maximum light sideways instead of downwards. Frosted lamps used.

Lamps for lighting low book-shelves screened from view by opaque parabolic reflectors. Lamps for lighting wall bookcases, backed by opaque trough reflectors.

Lamps for lighting free standing bookcases and reading tables screened from view by green plated glass domes.

Lamps for lighting exhibition racks screened by reflectors with green celluloid covers.

Wall bracket and column bracket lamps provided with deep enameled glass diffusing shades of sufficient depth to hide the lamp.

Frosted tip lamps.

Cheerful appearance of room.

THEATERS AND MUSIC HALLS.

In theaters and music halls, freedom from glare of bright lights in the auditorium is a prerequisite to ocular comfort. Up to within comparatively recent years little attention was paid to the physiological side of the design of lighting. That the pleasure of a good theatrical or musical performance may be marred by the glittering lighting of an auditorium is now quite generally appreciated, and fortunately

FIG. XVIII. NIGHT VIEW, LOOKING TOWARD THE BALCONY, MAJESTIC THEATER, FORT WORTH, TEX.

FIG. XIX.

*FIG. XVIII shows a night view of the interior (looking towards the balcony) of the Majestic Theater, Fort Worth, Tex.*

*The following data apply to this installation:*

*Ceiling height................50 ft.*
*Dimensions..65 x 78 = 5,060 sq. ft.*
*Outlets........7 (on upper ceiling)*
*Watts, 7,400; Watts per sq. ft., 1.45*
*Average Foot-candles...........3.2*
*Ceiling Tint...Light Fancy Stucco*

NOTE.—3 front fixtures each contain 1,800 watts. 4 rear fixtures each contain 500 watts. Center fixture in front hangs 10 ft. from ceiling. Other 2 front fixtures hang 8 ft. from ceiling. The 4 rear fixtures hang 36 inches from ceiling.

Under balcony, ceiling is 13 ft. 3 ins. and 15 ft. 6 ins. Area, 43 x 78 ft. = 3,350 sq. ft.

Total watts, 4,000.

Watts per square foot = 1.2.

8 fixtures; 5 hang 36 inches and 3 hang 48 inches. Each fixture contains 500 watts.

The auditorium is in the French Renaissance style, with color scheme of ivory and old rose.

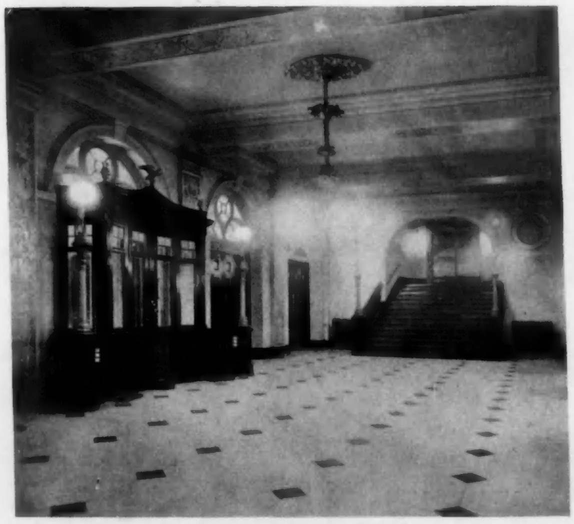


FIG. XX. GAS LIGHTING INSTALLATIONS IN THE ACADEMY OF MUSIC, PHILADELPHIA, PA. FIG. XXI.

*FIGS. XIX, XX, and XXI show views of the gas lighting installation at the Academy of Music, Philadelphia. Originally ordinary opaline glass globes were used on the Welsbach reflex burners on these chandeliers, but it was found that a much more agreeable light was obtained by the substitution of the pinkish yellow glass globes now used. The fixtures shown in Figs. XIX and XX have individual control of the gas and by-pass on each light. The chandeliers shown in Fig. XXI are provided with "jump-spark" ignition and the gas is controlled by a cock on each fixture.*

FIG. XXII. DIRECT LIGHTING OF THEATER BY CEILING LAMPS ENCLOSED IN PRISMATIC GLASS HEMISPHERES.

there will soon be no excuse for the frequent headaches due to improper lighting of such places of amusement. Well diffused and soft lighting is now coming to be the rule in the better class of theaters and music halls. Such lighting can be carried by direct, indirect, or semi-indirect methods or by a combination of these. The illustrations show examples of different types of lighting installations.

*FIG. XXII shows a decorated ceiling, studded with prismatic glass hemispheres which house the lamps. This method of illuminating theaters and music halls by direct lighting is frequently employed.*

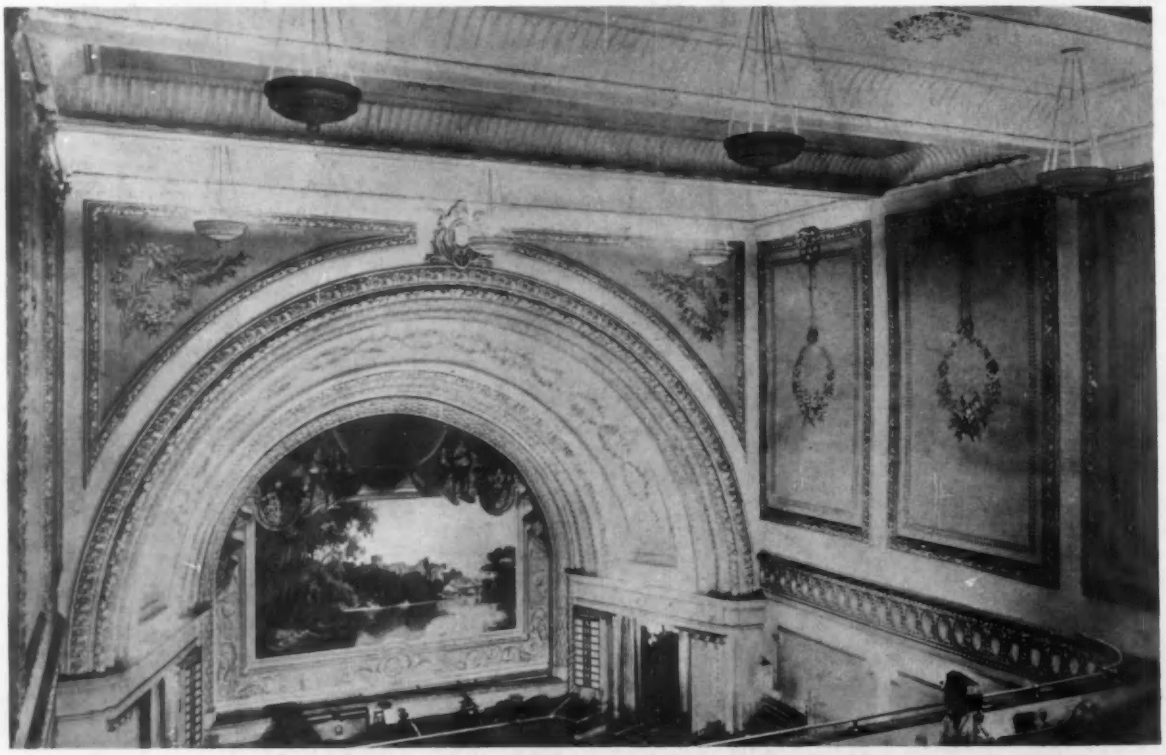
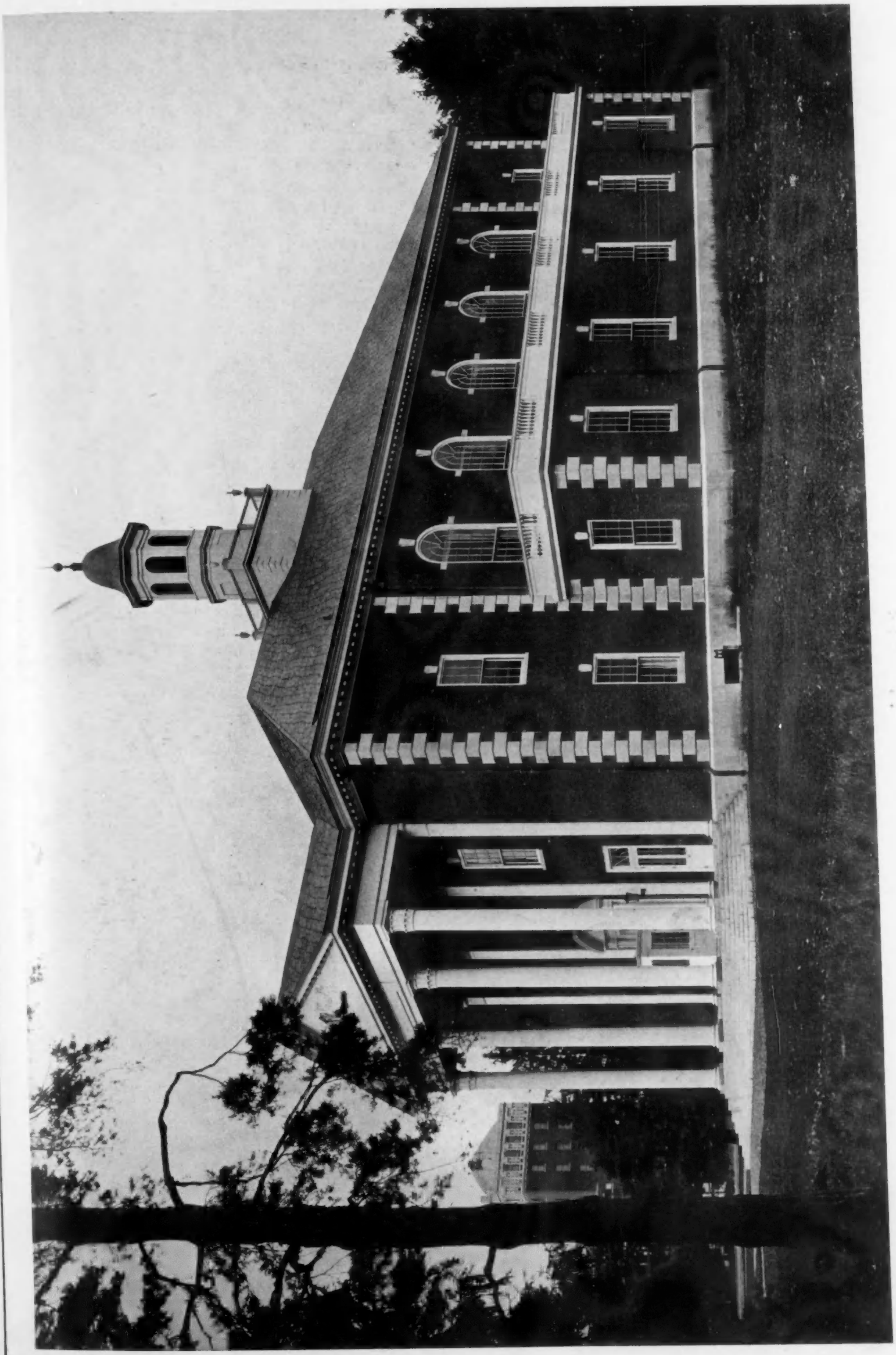


FIG. XXIII. INDIRECT LIGHTING IN PLAZA THEATER, CHICAGO, ILL.

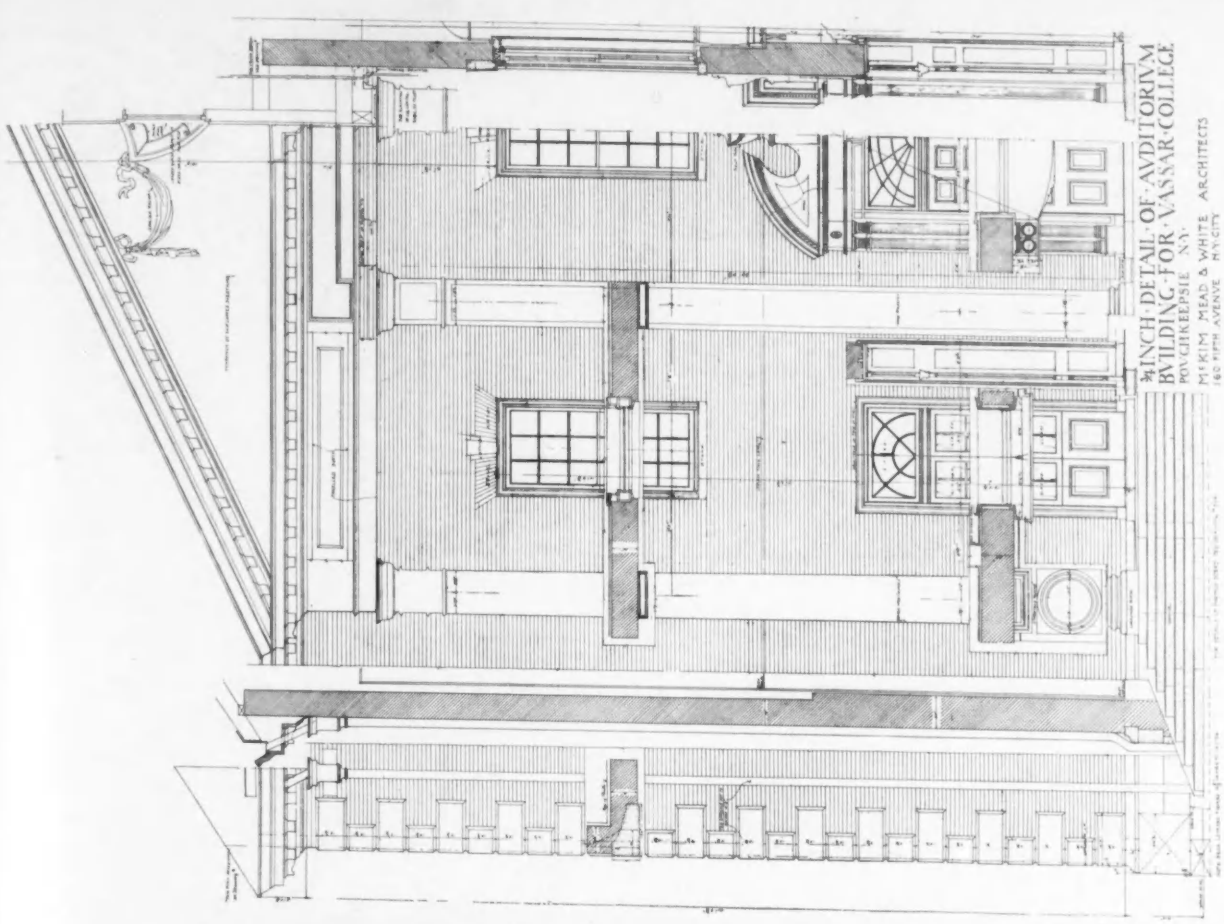
*Data*

| | |
|---|---|
| *Ceiling Height* | *49 ft.* |
| *Dimensions* | *49 x 105 = 5,145 sq. ft.* |
| *Outlets* | *9* |
| *5 100-watt Lamps per fixture* | |
| *Watts, 4,800* | *Watts per square foot, 0.93* |
| *Average Foot-candles* | *2.3* |
| *Ceiling Tint* | *Light Cream* |
| *Wall Tint* | *Light Buff* |
| *Distance to Ceiling* | *48 ins.* |



AUDITORIUM BUILDING, VASSAR COLLEGE, POUGHKEEPSIE, N. Y.
McKIM, MEAD & WHITE, ARCHITECTS

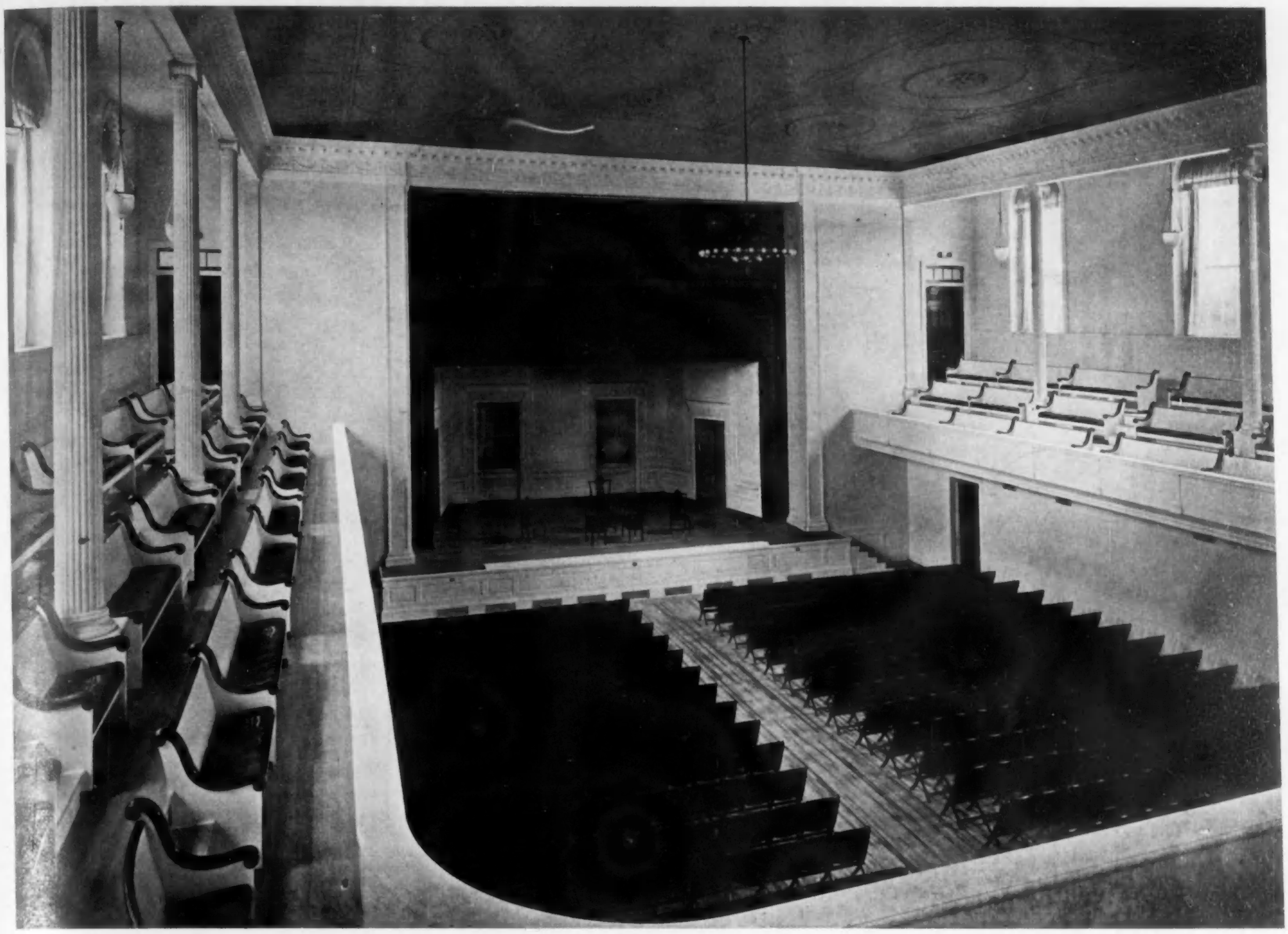
UofM



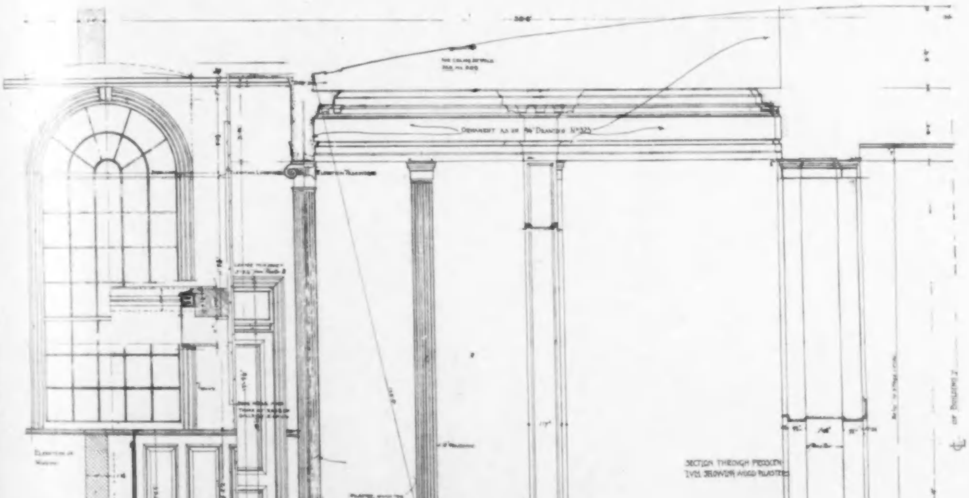

DETAILS OF FRONT PORTICO

AUDITORIUM BUILDING, VASSAR COLLEGE, POUGHKEEPSIE, N. Y.

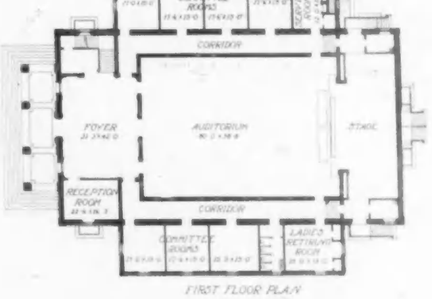
McKIM, MEAD & WHITE, ARCHITECTS



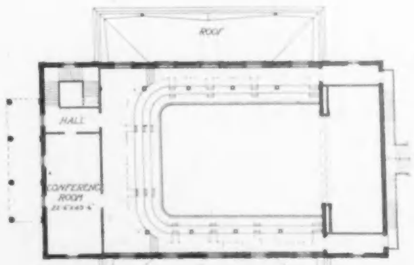
AUDITORIUM, LOOKING TOWARD THE STAGE



DETAIL OF AUDITORIUM FINISH




FIRST FLOOR PLAN




GALLERY PLAN

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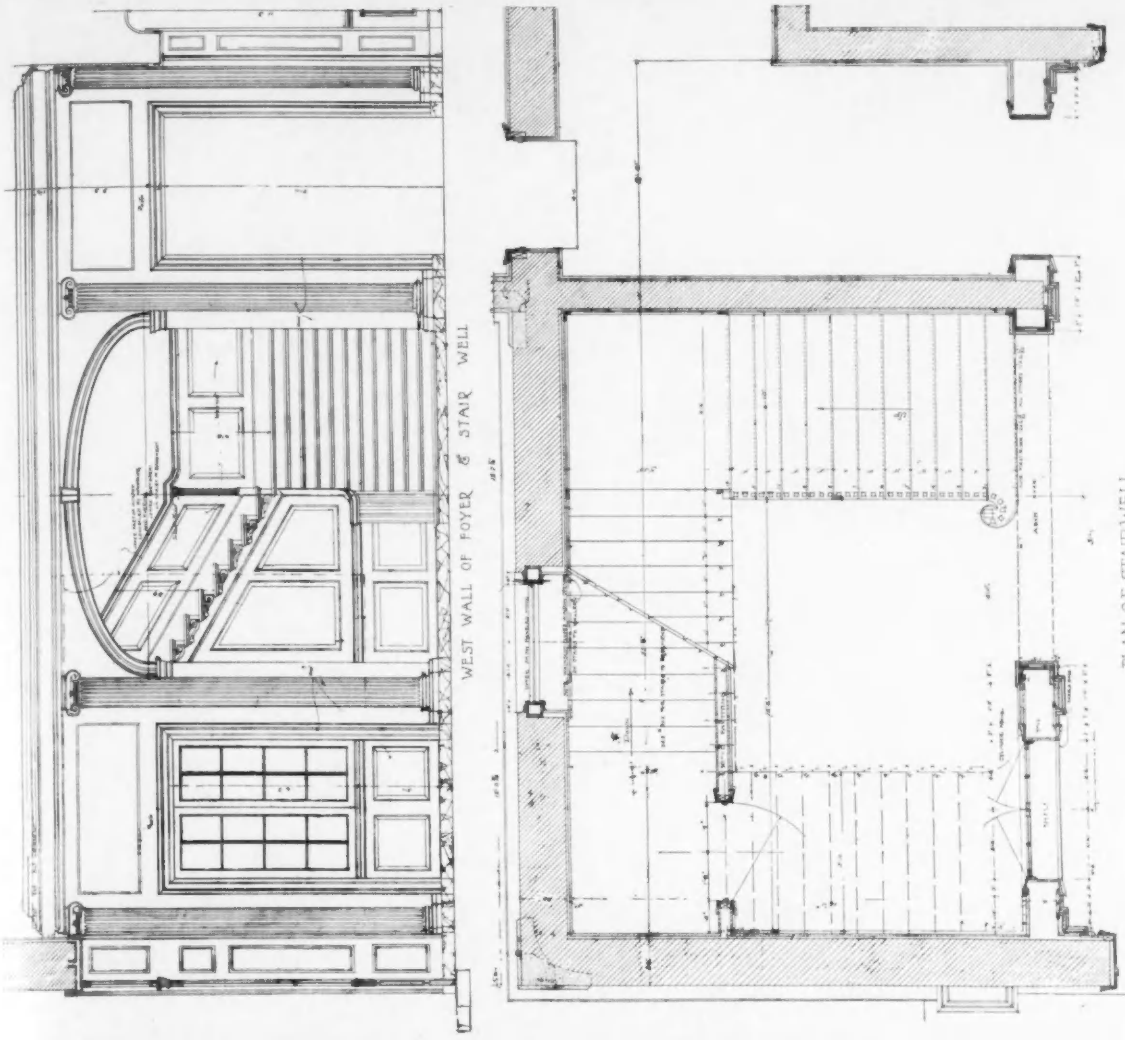
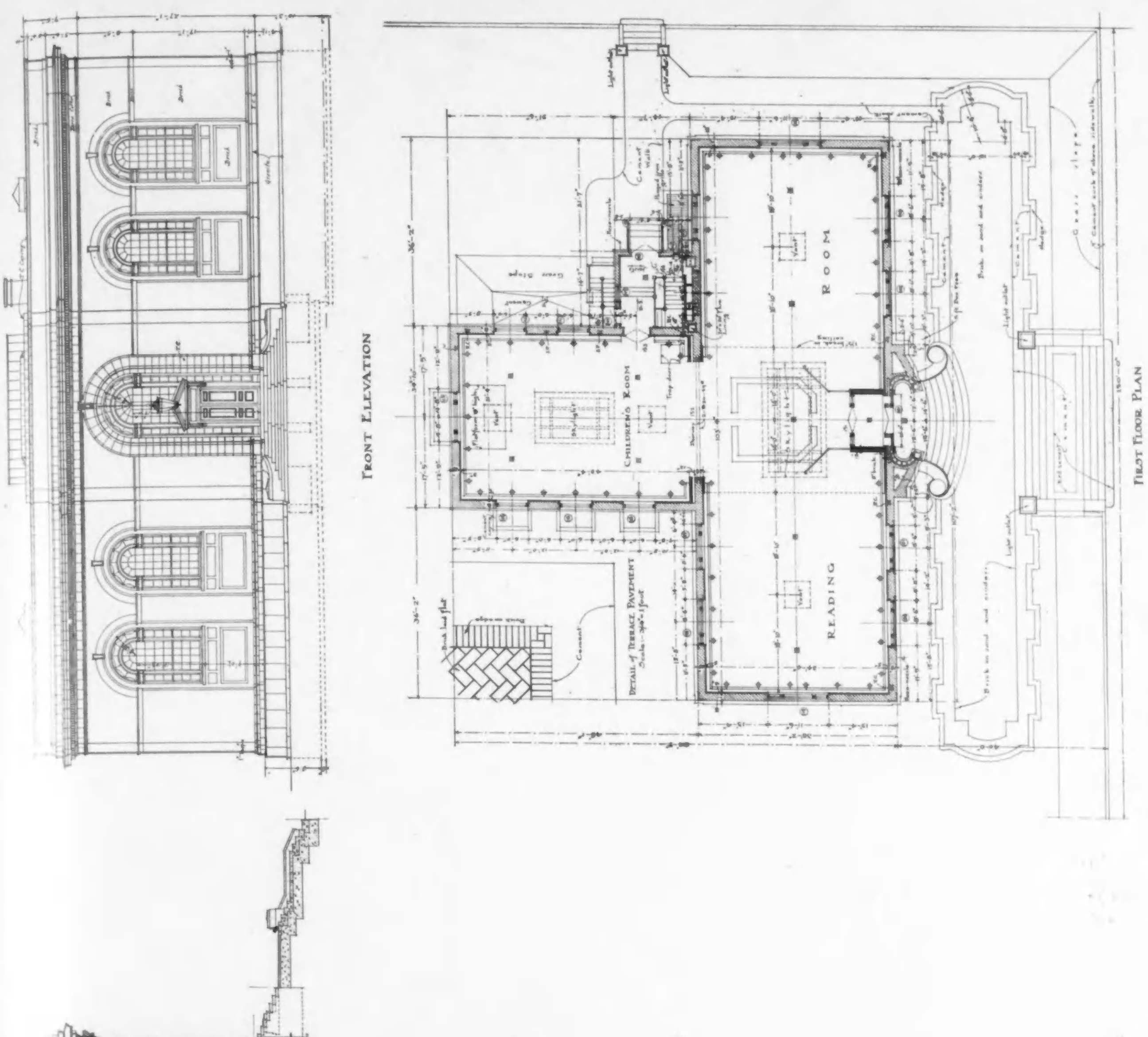
AUDITORIUM BUILDING, VASSAR COLLEGE, POUGHKEEPSIE, N.Y.
McKIM, MEAD & WHITE, ARCHITECTS




DETAILS OF FOYER AND STAIRWAY

STAIRWAY

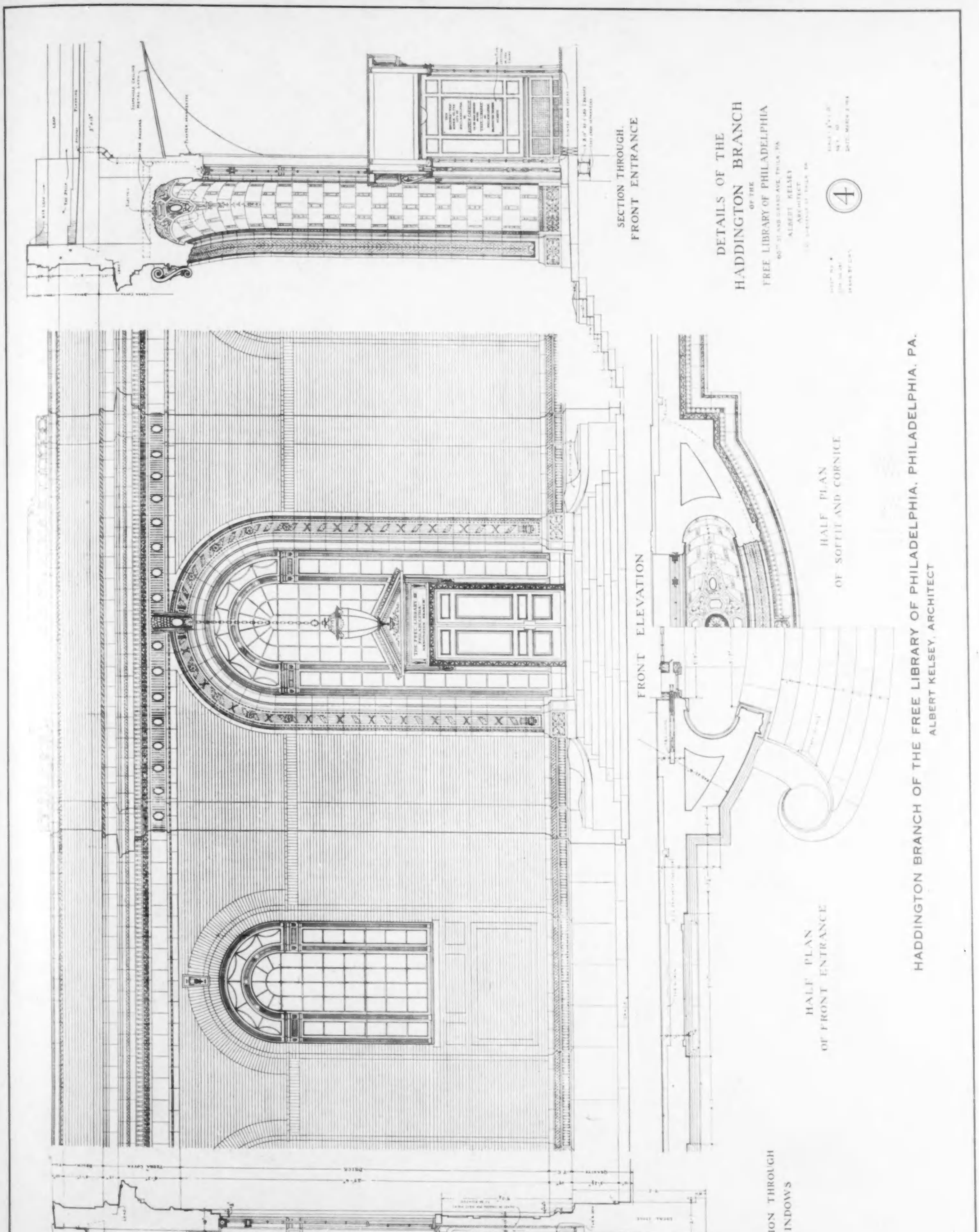
AUDITORIUM BUILDING, VASSAR COLLEGE, POUGHKEEPSIE, N. Y.
McKIM, MEAD & WHITE, ARCHITECTS



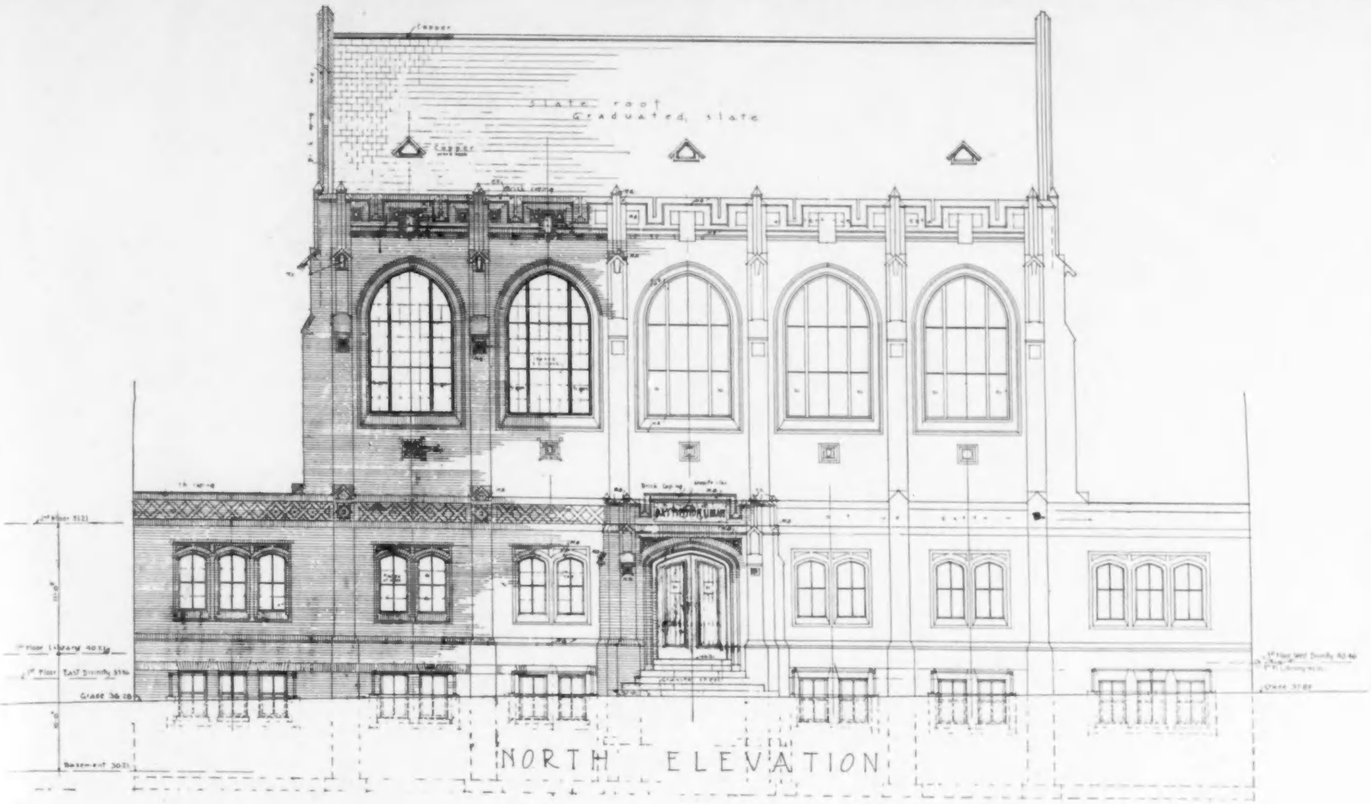

PLANS, SECTION AND ELEVATIONS

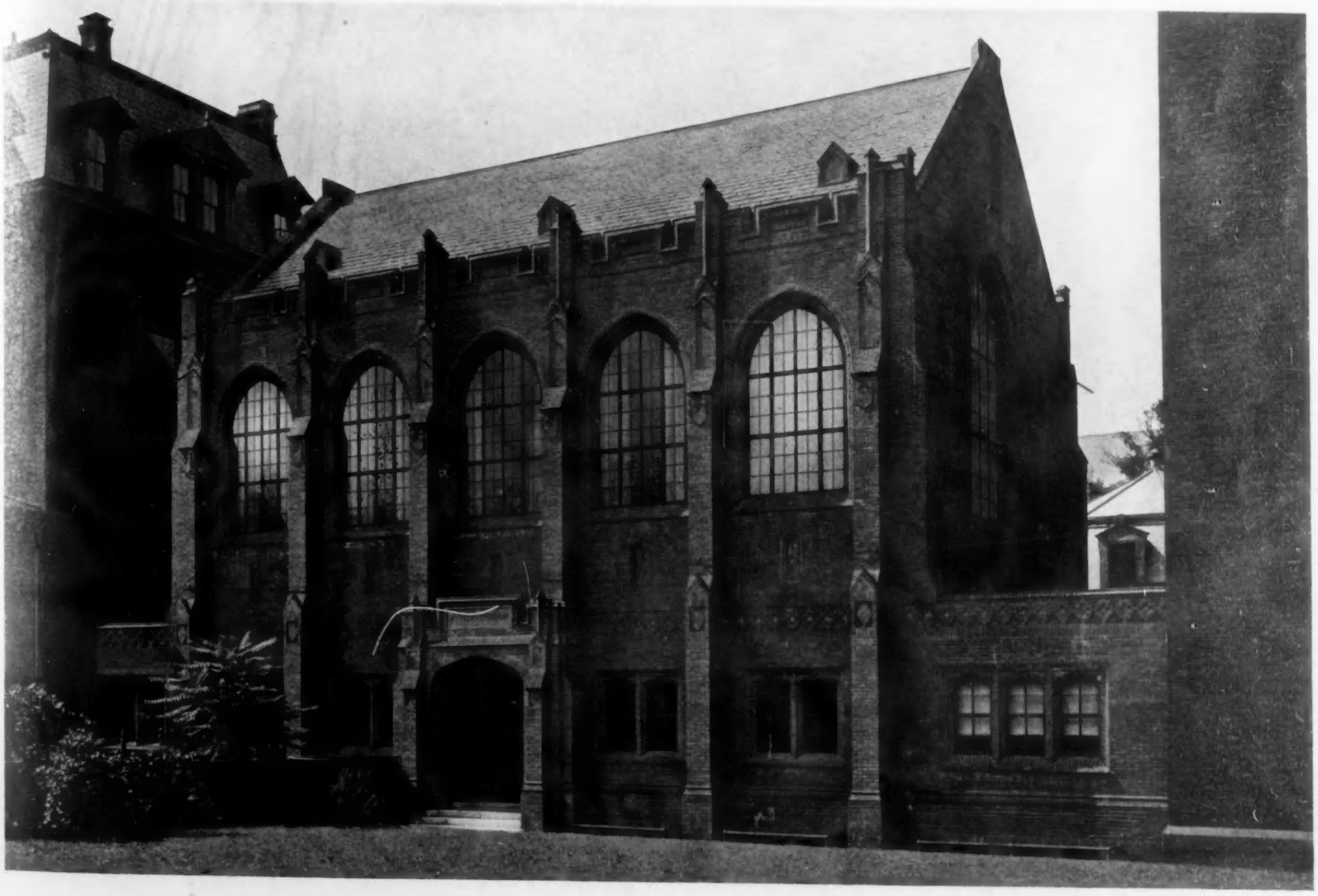
HADDINGTON BRANCH OF THE FREE LIBRARY OF PHILADELPHIA, PHILADELPHIA, PA.

ALBERT KELSEY, ARCHITECT



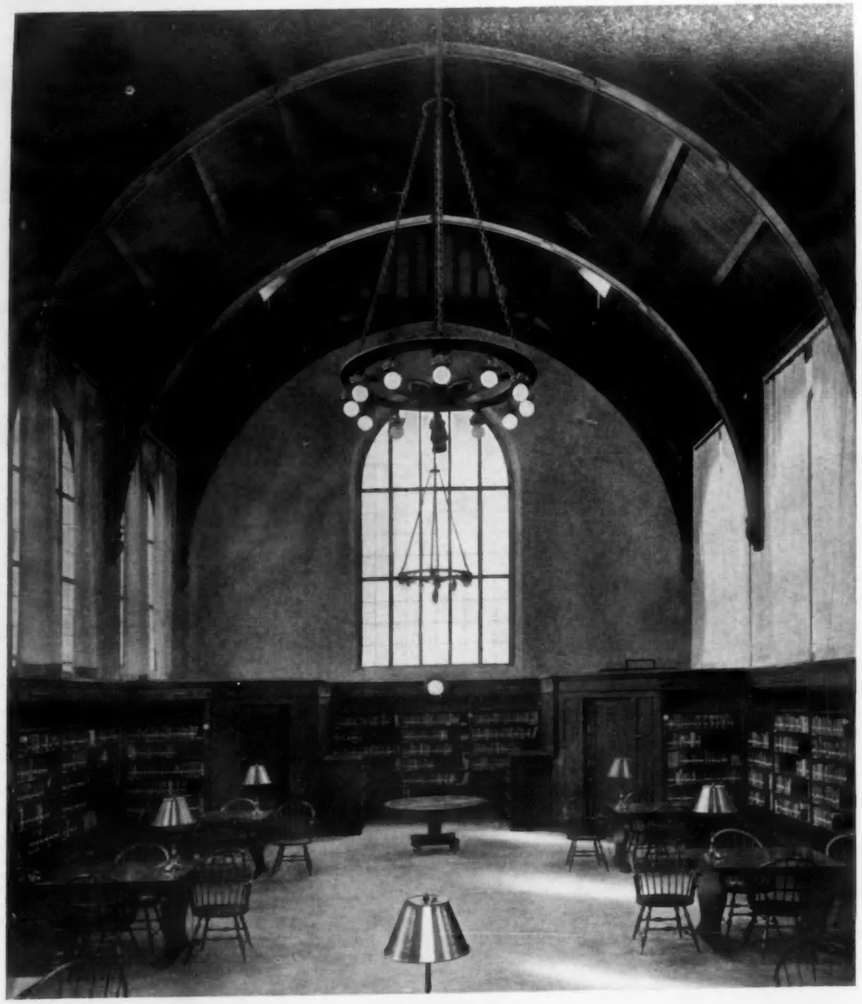

HADDINGTON BRANCH OF THE FREE LIBRARY OF PHILADELPHIA, PHILADELPHIA, PA.
ALBERT KELSEY, ARCHITECT



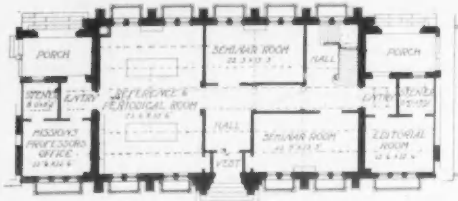



U of M

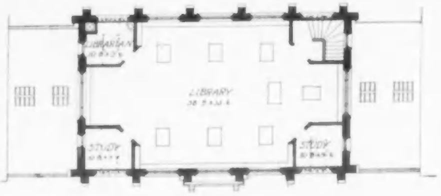
DAY MISSIONS LIBRARY, YALE UNIVERSITY, NEW HAVEN, CONN.
DELANO & ALDRICH, ARCHITECTS



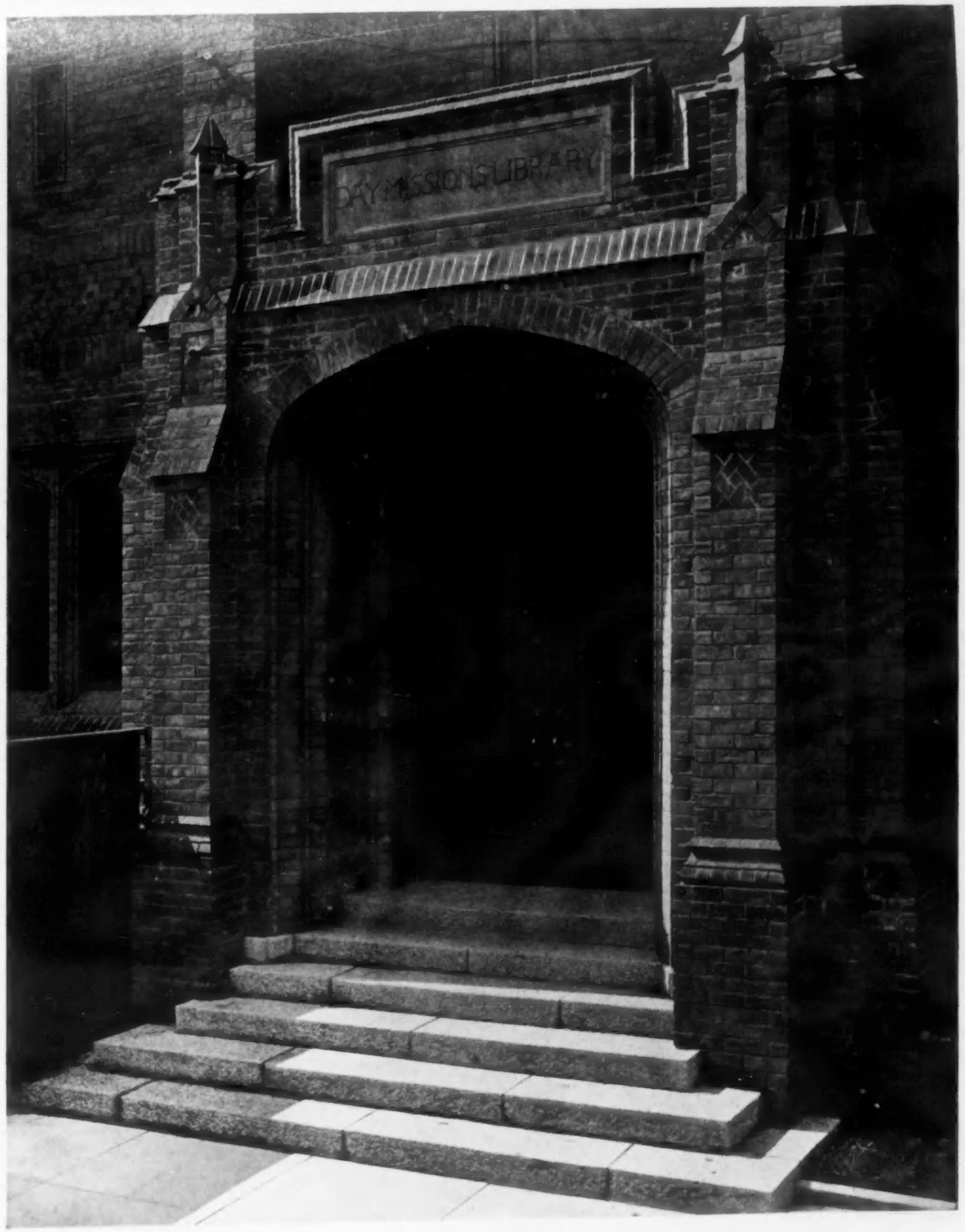
READING ROOM




FIRST FLOOR PLAN




SECOND FLOOR PLAN




DETAIL OF ENTRANCE

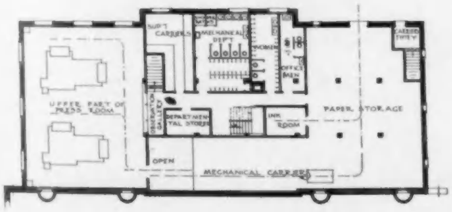
DAY MISSIONS LIBRARY, YALE UNIVERSITY, NEW HAVEN, CONN.

DELANO & ALDRICH, ARCHITECTS

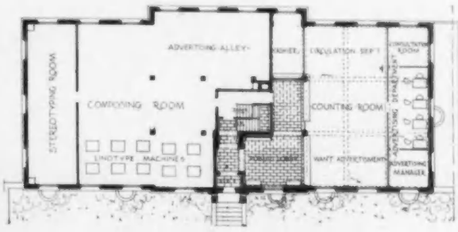
ST. JOSEPH NEWS PRESS BUILDING, ST. JOSEPH, MO.
ECKEL & ALDRICH, ARCHITECTS

VOL. 22, NO. 11. PLATE 170.

DETAIL OF FRONT ELEVATION




MEZZANINE FLOOR PLAN

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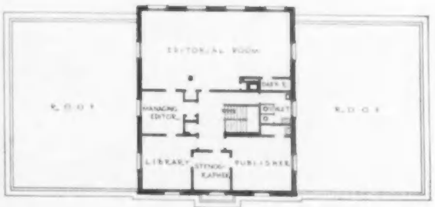
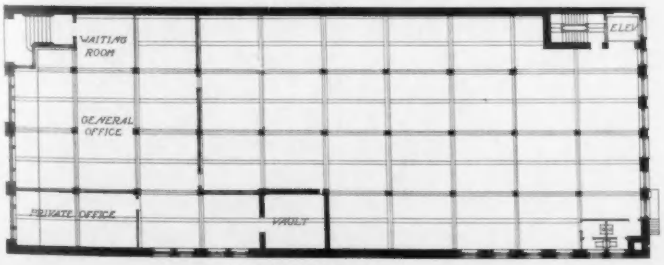



SECOND FLOOR PLAN

## ST. JOSEPH NEWS PRESS BUILDING, ST. JOSEPH, MO.

ECKEL & ALDRICH, ARCHITECTS



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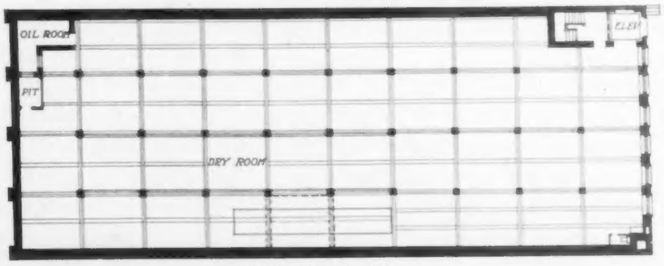
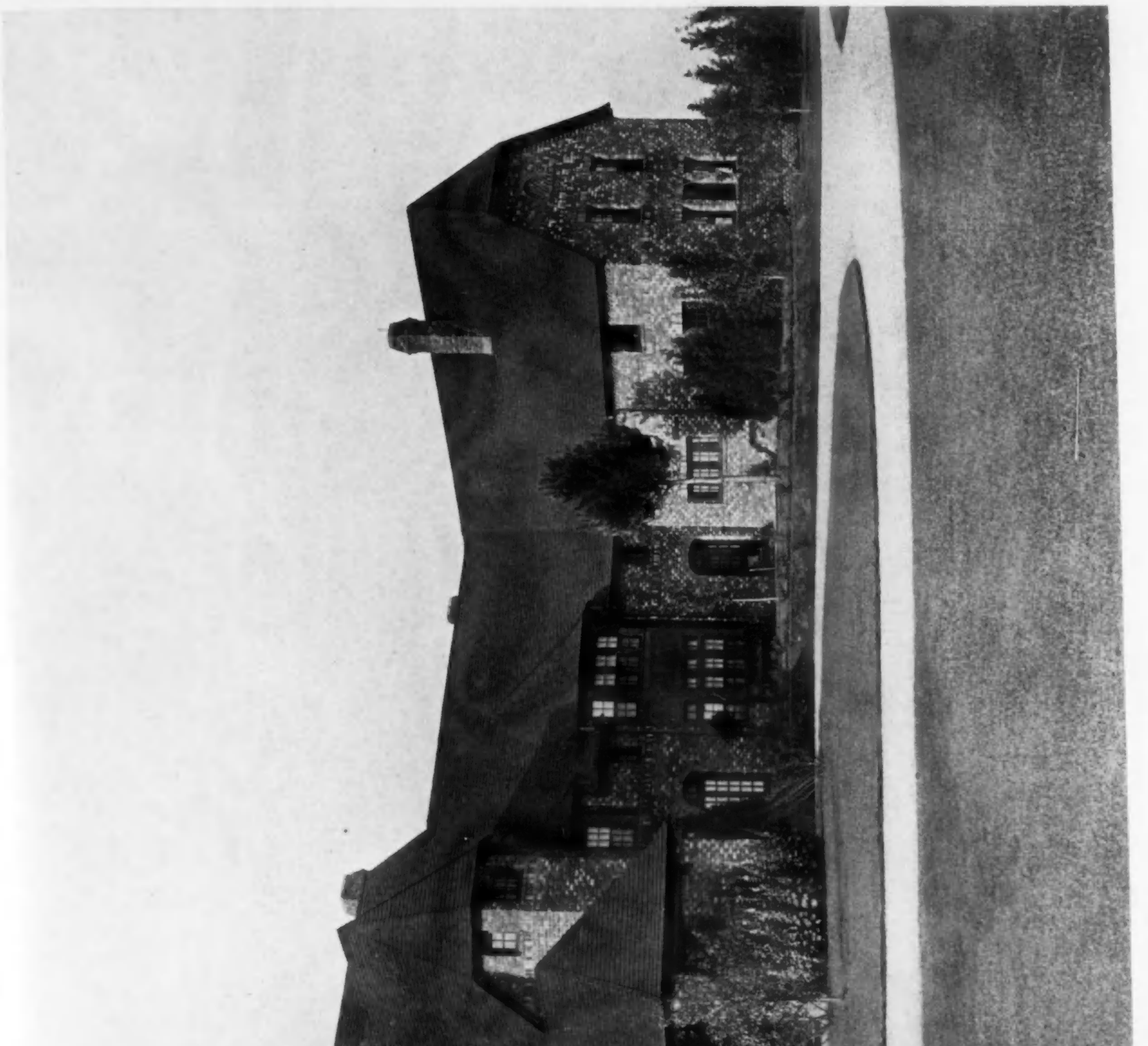


BASEMENT PLAN

U of M

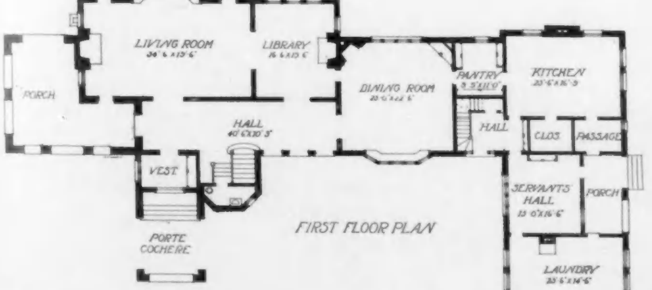
MANUFACTURING BUILDING, ST. LOUIS, MO.

MAURAN, RUSSELL & CROWELL, ARCHITECTS



HOUSE AT SOUTHAMPTON, LONG ISLAND, N. Y.
GROSVENOR ATTERBURY, ARCHITECT

DETAIL OF FRONT ELEVATION



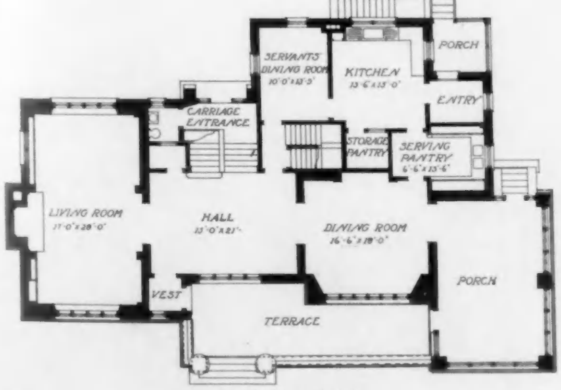
DETAIL OF GABLE

**HOUSE AT SOUTHAMPTON, LONG ISLAND, N. Y.**

GROSVENOR ATTERBURY, ARCHITECT

GENERAL VIEW

SECOND FLOOR PLAN

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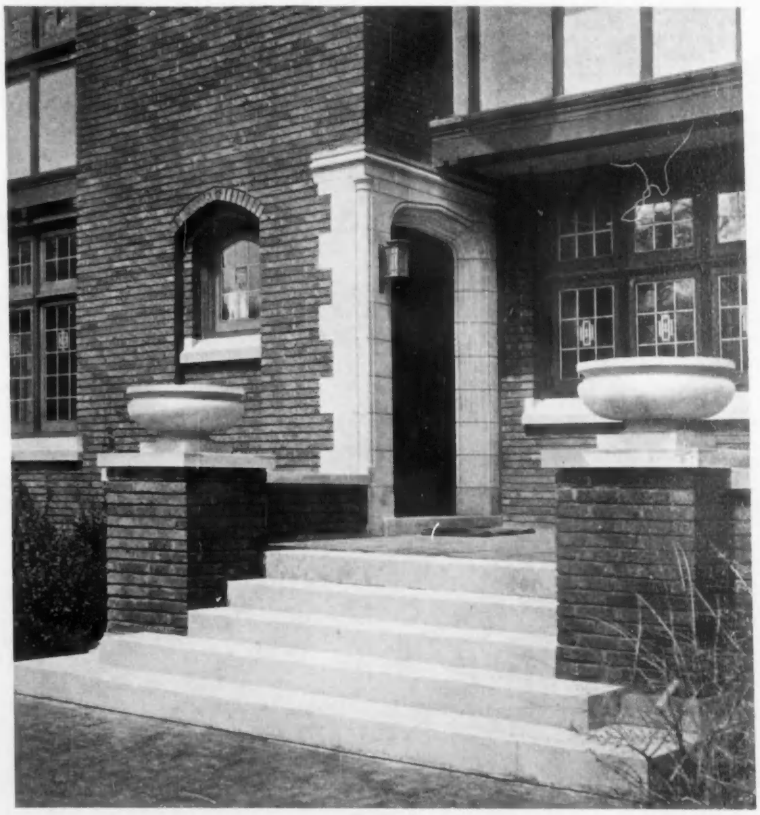


DETAIL OF ENTRANCE

HOUSE AT KENILWORTH, ILL.

NIMMONS & FELLOWS, ARCHITECTS

LIVING ROOM

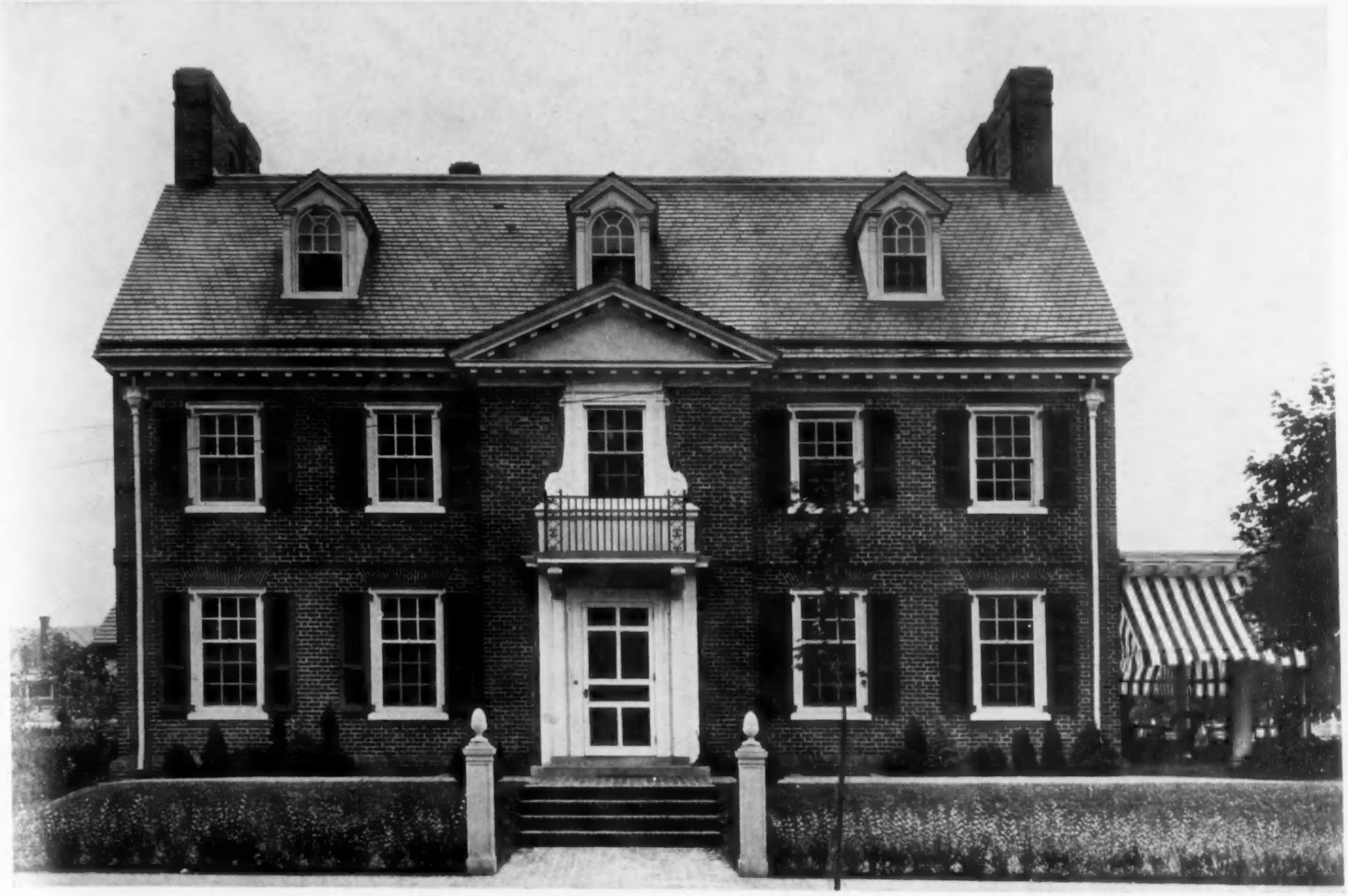
SUN ROOM

ENTRANCE HALL

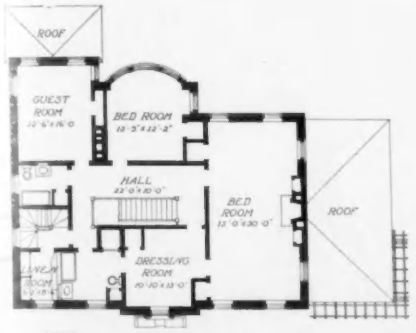
HOUSE AT KENILWORTH, ILL.

NIMMONS & FELLOWS, ARCHITECTS

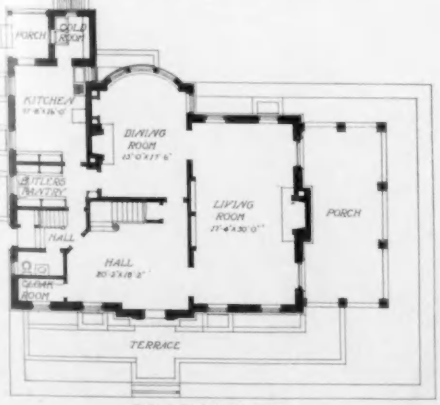
VOL. 22, NO. 11. PLATE 176.



GENERAL VIEW




SECOND FLOOR PLAN




FIRST FLOOR PLAN

DETAIL OF GABLE

UofM

HOUSE AT WILMINGTON, DEL.

CHARLES BARTON KEEN, ARCHITECT

# The Business Side of an Architect's Office.

## DESCRIPTION OF THE OFFICES OF MESSRS. HENRY BACON; FORD, BUTLER & OLIVER; LUDLOW & PEABODY; H. VAN BUREN MAGONIGLE AND KENNETH MURCHISON.

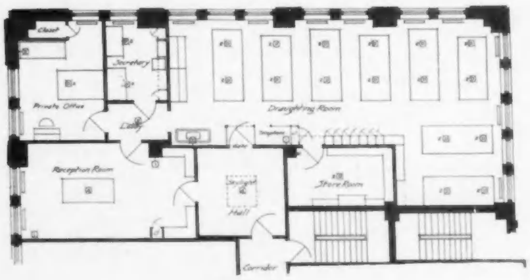
BY D. EVERETT WAID.

THE office of Henry Bacon in the new Architects' Building, at 101 Park avenue, New York, is an exemplification of our remark that architects' offices express the personality of their designers. The arrangement is straightforward and adapts itself to business requirements in the most direct way. The impression of quiet good taste made upon one as he enters the hall is retained even through the drafting room. It is consistent with the refined monumental character of the Lincoln Memorial, the restrained artistic use of fine materials in the Union Square Savings Bank, and the chaste beauty of many monuments designed by Henry Bacon.

ENTRANCE TO RECEPTION ROOM.

The walls are covered with monk's cloth, a fine open mesh material of a somewhat different texture from burlap and of a mellow yellow tone. The floors of the reception room and hall are a cloudy gray composition similar in appearance to concrete. The ceilings are kalsomined to tone in with the wall coverings and the trim is painted.

One may be pleased to note that in the amply lighted private office the drawing table dominates the desk. The drafting room is delightfully neat and well lighted. The sink, telephone booth, and wardrobe lockers are conveniently ranged along the inner wall, and the screened gate is at once a convenient access and bar to visitors consulting about work in progress. The storeroom has an unusually spacious appearance, for all drawings are folded and filed in short boxes.



PLAN.

It is worthy of note that Mr. Bacon uses no printed forms. Even his certificates are typewritten.

The office of Ford, Butler & Oliver seems *multum in parvo*, when one shakes hands with three strapping partners. But the welcome accorded to the visitor by the reception room as well as by the firm is pleasant, and that is certainly one of the first essentials if clients are expected to call and accept the advice of an architect.

The plan indicates a working arrangement which should be effective in results following the supplementing efforts of three active men. The whole office, aside from entrance and reception rooms, is one room 12 feet high, with good light and air, while a considerable degree of individual privacy is obtained by means of the 7-foot dividing partitions. Some of the partitions visible to the caller are oak sash and obscure glass, while others and the walls are covered with clouded brown-bronzed burlap to agree with the brown oak trim, and all are warmed by the red tile floor and lightened by a white ceiling. The furniture is black, of which one piece is well adapted to restricted space,—namely, a small, square telephone table with a stool sliding under.

The printed forms used by Ford, Butler & Oliver are exceptionally interesting. They are the fruit of a long experience in one of the big offices where one learns the need of a system capable of caring for large affairs without becoming unduly complicated. That, in short, is the purpose of this series of articles which are in-

DRAFTING ROOM.

RECEPTION ROOM.

OFFICE OF HENRY BACON.

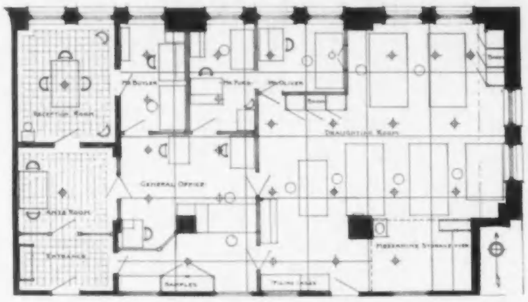
tended to show the methods of many architects, and then illustrate a system calculated to expand easily from a small practice to the needs of a large one. Mr. Lyman Ford has met the problem for his firm first of all by adopting 8 inches by 5 inches as a standard size for printed forms. Certificates, orders, superintendents' reports, office memoranda, specification reminders, time sheets, ledger, cash book, etc., all are 8 inches by 5 inches, and all fit in loose-leaf binders, with strong paper or canvas backs as severity of use may require. These binders slip into a coat pocket, and, as sheets can be added or removed with quick facility, instructions may be sent to a building, or reports received, and filed in these binders where they can be consulted. Model or typical specifications, a paragraph to each page, are bound in the same way, and it should be the easiest matter in the world to slip a needed book of specifications in one pocket, a ledger in another, and take home enough work to last all night despite the protests of one's longsuffering wife.

This firm uses the new set of contract papers recently standardized by the Institute. Correspondence for one building is filed by itself, letters received and copies of letters sent being kept separate in neat, quick binding vertical guide folders. One loose-leaf binder contains the list of drawings made for each building, with spaces for recording the issue and return of every blueprint of every drawing. When a building is completed, the record of drawings for that building is removed from the binder and filed away with the drawings.

In connection with the bookkeeping accounts, the overhead charges (which include salaries of members of the firm) are figured per year and per hour of the year, so that at any time the run of drafting expense can be compared with overhead charges and an indication had as to the need of securing more work or discharging some draftsmen. In fact, Mr. Ford charts the expenses, and thus can see graphically how the ratio is varying between overhead and drafting expense.

It may be added that Ford, Butler & Oliver use a printed head for rendering bills to clients. The sheet is folded once, and has within a schedule of charges together with some paragraphs on "General Practice." On the first page under the bill occurs this printed note: "This charge is based on a total commission of ...... per cent as per schedule on the inner side of this sheet."

Another of the offices which we are visiting in the Architects' Building is that of Ludlow & Peabody. The plan tells its story clearly and shows how a scheme not unlike others in its main ideas can be adapted to suit the space occupied. One of the attractive features of this suite is a generous supply of fine photographs of architectural masterpieces which cover the walls of the drafting room and afford a persistent educational influence, not to say inspiration, to



PLAN.
Office of Ford, Butler & Oliver.

RECEPTION ROOM.
Office of Ludlow & Peabody.

PLAN.
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SUPERINTENDENTS REPORT

PRINTED FORM.
Office of H. Van Buren Magonigle.

DRAFTING ROOM.
Office of Ludlow & Peabody.

SUPERINTENDENT'S REPORT ON BUILDING

Report No. 851 Date 19

1 Building
2 Weather conditions
3 Time lost owing to bad weather
4 Number of men at work
5 Work being done
6 Work finished
7 Defective work found
8 Condition of formerly reported defective work
9 Work done since last report
10 Materials delivered since last report
11 Materials wanted on work now
12 Mechanics wanted on work now
13 Materials needed two weeks hence
14 Mechanics needed two weeks hence
15 If work is delayed, or will be delayed for want of materials, details, or for any other reason, state for what and make any remarks not covered by above:

Signature

PRINTED FORM.
Office of Ludlow & Peabody.

the workers there. To refer to only a few details of office administration, it may be noted that their specifications are typewritten to the limit of six copies and additional needed copies are blue-printed from the original typewritten sheets which are made fit to yield good prints by the use of double-faced carbon paper.

Ludlow & Peabody use a form of superintendent's report which is here reproduced. Such blanks are demanded in architects' offices, as is evident by the number who use them. But their wide variety suggests differences of opinion as to what should be recorded in superintendents' reports.

This firm uses a printed postal with which it announces to competing contractors the name of the successful bidder and expresses its thanks for the bids submitted. In addition to the customary printed forms, Ludlow & Peabody keep a registry of drawings and record of issue on colored cards, one color for each class of drawings, including even progress photographs and specifications. One card is used for each drawing — a somewhat bulky system. They have also a printed "Form of Proposal," an "Acceptance of Proposal," a slip for office record of "Disbursements" on clients' account, and an "Informal Debit and Credit Memoranda."

The new office of H. Van Buren Magonigle will be of special interest to those who have seen his articles on "The Preparation of Working Drawings" in THE BRICKBUILDER and who know why he is an authority on the subject.

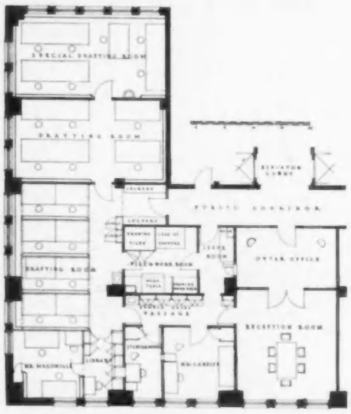
Mr. Magonigle's conviction which governed in working out the plan of his office is that business should be kept out of sight and by means of a suitable esthetic impression make the client feel that he is visiting, not the commercial shop, but the studio of his architect.

From the spacious outer office or anteroom, a visitor is ushered into a generous reception room. Business headquarters are next door to the reception room. Mr. Magonigle's private room is in reality the principal one of a series of alcoves into which the main drafting room is divided. The photograph shows a typical one of these alcoves which gives one or two men a desirable freedom from interruption and affords them much needed wall space. The drafting tables are 3 feet 6 inches wide and 2 feet 6 inches high, — the low tops giving a wide effective angle of light. Note the portable lamps for the drawing tables, hooks for support of office sets of blueprints, shelves for drawing boards or mounted drawings.

The apple-pie order of the office (and it really exists) seems only the logical result of an orderly plan. Note the photographic view into the two doors of the "Supply Closets."

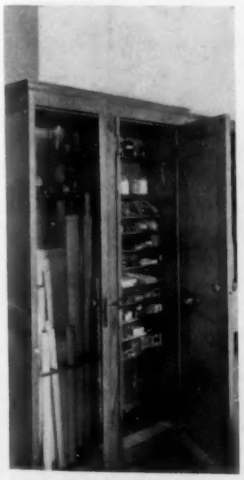
All drawings are filed flat by suspending them vertically in a big cupboard. Each set of blueprints is bound between two thin flat strips of pine, and can be hung in the permanent file room or in an alcove for convenient reference. Tracings of current work drawings are kept horizontally flat in drawers and later are bound and hung in the permanent file closet. A description of this orderly and compact method of filing, which is by the

TYPICAL ALCOVE IN DRAFTING ROOM.



PLAN.

DRAFTSMAN'S TIME SHEET.



SUPPLY CLOSET IN DRAFTING ROOM.

RECEPTION ROOM.

OFFICE OF H. VAN BUREN MAGONIGLE.

FILING CLOSET FOR DRAWINGS.

way economical as it needs no expensive drawers or racks, may be found in the May, 1913, issue of THE BRICKBUILDER.

Mr. Magonigle has discarded an elaborate card system of registering drawings and keeping record of their issue, and has all of this history kept on slips permanently attached to the office copy of each set of drawings.

Pay day, as in many offices, comes once a month, and each draftsman is expected to tack his time sheet up near his table and enter time "daily and accurately."

Overhead charges in Mr. Magonigle's office are calculated in an unusual way. They include rent, supplies, and salaries not apportioned to individual jobs. All expenses directly chargeable to individual work, including specification writing, and including a salary which the architect allows to himself, are called drafting expense. The common method of figuring the real cost of architects' total expense on any given building is to add to the drafting expense such a percentage of that expense as the total overhead cost per month bears to the total drafting cost. Mr. Magonigle, however, divides his total overhead cost for the month by the total number of drafting hours for the month. The resulting fixed sum per drafting hour multiplied by the total number of hours worked on some one building would represent the total overhead cost on that particular building. Inasmuch as there is great disparity in salaries per hour, a uniform allowance per hour for overhead would appear rather disproportionate. It will be interesting to compare the two methods

PLAN.

and see if they average up in fact as nearly parallel as "match" and "medal" scoring in golf.

Kenneth Murchison's new office seems to have been planned on a theory somewhat different from the scheme adopted by most architects. Here, the visitor, instead of seeing the reception rooms only, is ushered into the middle of the business activities of the office. The idea is not uncommon in offices in which one person takes care of all the secretarial duties and makes the anteroom, where his or her desk is located, a reception room beyond which most visitors are not invited. In Mr. Murchison's office, the visitor finds himself in a spacious central office, where his interview is held within sight and sound of several busy desks, unless he is invited to go into the private room of some chief assistant or into Mr. Murchison's own room, which is the only real reception room in the office. The attractive features of this office may be perceived both in the plan and in the photographs.

For conducting the routine work, Mr. Murchison has a considerable number of printed forms in various sizes; and he realizes that some of his blanks will be improved by revision of matter as well as size — the latter having more regard to uniformity. The tendency, it may be remarked here, seems to be toward adopting the regular business letter sheet as standard size for printed forms and specifications. Certificates, orders, etc., may well be just one-third size — in other words, a full sheet folded gives triplicate copies.

RECEPTION ROOM.
OFFICE OF KENNETH MURCHISON.

MAIN OFFICE.

# The Quantity System In Estimating.

GENERAL DISCUSSION.

*IN THE BRICKBUILDER for October there was published an article by Mr. Sullivan W. Jones, of the firm of Palmer, Hornbostel & Jones, architects, New York City, entitled "An Appeal to the Architect for the Adoption of the Quantity System." Copies of this article were sent to the Secretaries of the Chapters of the American Institute of Architects with the request that they bring the matter before their members and furnish us an expression of opinion on the merits of the system proposed by Mr. Jones and the value of the quantity system in estimating, generally considered. A number of replies have been received from Chapters and individuals and part of them are presented below. Others will be given in later issues of THE BRICKBUILDER. It is felt that this is a subject of especial interest to the architectural profession and it is the purpose of THE BRICKBUILDER to give enough of its space from month to month for a reasonable debate of its merits.— Editors.*

*Editors, THE BRICKBUILDER:*

YOUR article brings to general attention a matter of extreme interest. It has long been a matter of wonder to those familiar with the work of the quantity surveyor abroad that the waste, duplication of labor, and liability to serious mistakes and loss incident to our haphazard methods should be allowed to continue. The excuse contractors have given for the continuance of the system of individual quantity-taking has been that no two take off quantities or figure alike. Some figure brick per thousand laid, some figure the materials and the labor as separate items. Some might cube a building and submit a straw bid based on a cost per cubic foot. It is certainly time that this babel of methods and this guesswork bidding should be replaced by accurate methods generally accepted.

The condemnation of the plans and specifications prepared by architects for bidding is unfortunately based on a considerable majority of drawings and specifications so used; but it might also be stated with truth that a large number of architects have neither the education nor experience to justify their being classed as architects. The majority of men who in their respective communities command respect as architects of good standing produce working drawings and specifications which are fairly clear, exact, and complete. Even these would, however, be benefited by the scrutiny of the quantity surveyor in taking off quantities.

Many individual architects have given "constructive thought to the active relationship existing between himself, the contractor, and the owner," and the standard documents of the American Institute of Architects were largely based on individual documents. It is not therefore quite fair to state the contrary so strongly, but one delights to hear it definitely stated that failure in a specification is due to "want of intelligent preliminary investigation," "lack of accurate knowledge," and lack of "the power of expression." These appear to be the very kernel of the matter, and it cannot be too often stated and insisted upon that writing specifications is a task of great difficulty requiring exceptional knowledge and no little literary acumen. The man who knows his subject and knows how to express himself will never take refuge behind blanket clauses.

Anything that will encourage better drawings and specifications should receive the support of all architects — even if we never attain the Utopian ideal of wording that "shall not be capable of more than one clear and definite interpretation by the bidders." The interpretation of words is an extremely complex and difficult subject in a country so large, where the same word means different things in different parts of the country.

To produce drawings and specifications such as are desired requires time, and the owner who wishes the doubtful advantage of competitive bids should be given clearly to understand that such bids are properly based on complete drawings and accurate specifications, and for this the owner must not only allow time, but must also know what he wants. In any comparison with Europe one must bear in mind that our building operations take very much less time than theirs, and that any system which requires English time for execution is out of the question here.

The introduction of making one survey of quantities for all builders would eliminate much waste of time and put all on the same basis as to data. It is not clear, however, how a builder could estimate "on bills of quantities and not on drawings and specifications."

The payment of the cost of the survey should surely come directly on the owner and not indirectly. He must pay it in the end, and as the work, like that of the architect, is done for him and in his interests, he should be paid by and be responsible to the owner. It is not clear why he should be paid on the basis of the cost of the work. It is no more laborious to take off plain marble ashlar than to take off the quantities of shingles. It would seem as if quantities rather than cost should be the basis of the charge, unless indeed it were frankly based on time.

The general scheme proposed seems excellent and should be supported.

R. CLIPSTON STURGIS.

*Editors, THE BRICKBUILDER:*

The very admirable article in your last issue, by Mr. Jones, on the subject of the quantity system in estimating, presents the case from the English standpoint so well that it seems only fair to consider whether or not our present system, with which so much fault has been found, may not have its good points and be quite as efficacious as the continental method. I do not believe it is quite fair to the profession to say that all of our plans are indefinite, that the drawings and specifications issued by the vast majority of architects fail wofully in any respect, and that the use of blanket clauses in the contract indicate any consciousness on the part of the architect of his failure to fully perform his obligations to the owner and contract. That may be only another way of saying that most archi-

tects don't know their business anyway, or, to put it in milder form, that only a few architects are the best architects, a proposition which of course no one would question, but measured by its results it is my belief, after having started with a different idea many years ago, that our system is preferable to that adopted abroad. I have been enabled to make repeated comparisons between results here and in England and I find quite as much uncertainty there as to what a contract includes, as great a latitude in the estimates which builders will make, and as much difference in the percentages of profits there as is the case here, notwithstanding the fact that in England the work is conducted along much surer lines, there is not as much hazard due to attempt for speed in work, and builders are not so prone to take on more work than they can properly attend to. It is my belief, based upon my personal experience, that the system of quantities to be supplied in advance to a builder is simply making it a little easier for him to go through one of the steps leading up to the preparation of a distinct bid, that it doesn't result in any closer figures, in any economy to the owner nor in any surer precision in regard to requirements, while on the other hand it distinctly does substitute a system of bookkeeping for intelligent discrimination in prices. No builder who has had any special experience would undertake to make up his prices from a bill of quantities without the most careful reference to the particular conditions under which those quantities were to be considered, and referring again to my own experience, which has included a very fair variety of work both as to character and to cost, I would place more reliance on an estimate for a building which was based upon the intelligent study of the plans and the site and a comparison with other buildings of the same type than I would upon an estimate which was based chiefly upon a bill of quantities, no matter how carefully produced. If we were to say that we all do our business in too much of a hurry, that we none of us make our drawings any too well, that incidental to the conduct of a large business carelessness in details is inevitable, there would surely be no discussion; and all these factors lead to the uncertainty in plans and specification about which your article complains; but the remedy in my judgment is not to substitute a cast iron bill of quantities, but rather for the architect to be more careful with his plans and specifications and for the builder to base his prices not upon what he thinks the building will cost but what he knows a similar building has cost, and that is by no means a question of quantities. I would deplore the introduction into this country of a quantity surveyor, and the very blanket clauses of which Mr. Jones complains are no stronger than are found in the majority of specifications the world over, and so long as we are dealing with the element of chance and the fallibility of human intelligence, such blanket clauses must be put in for the protection of all parties in interest. It works both ways, and considering the fact that builders make far more money as a rule in this country than they do abroad, that the volume of business handled by a successful architect is vastly greater than a European architect usually has to administer, I cannot see that the faults of our system lie with the absence of the quantity surveyor, but rather in the inherent haste to which we feel called upon to yield. Our architects and builders are already far ahead of their foreign competitors in matters of economy, speed, and the character of work. Give us time and I believe the difficulties of the present system which appeal so strongly to Mr. Jones would not exist in connection with a well-organized, first-class architectural office.

C. H. BLACKALL.

*Editors, THE BRICKBUILDER:*

Building contractors are the ones suffering most under the present method of quantity-taking from the architects' plans and specifications, and it is surprising that they have not attempted to reform the present haphazard method and for their own protection establish the office and employ a qualified quantity surveyor.

A contractor's success in lump sum contracts depends upon a correct estimate and as a matter of course his embarrassment and efforts to squirm out under a losing contract affect the equanimity of the architect and owner and necessitate close supervision.

Mr. Jones shows in many instances the evils of the present system and then misses the remedy by so distorting the excellent system employed in England as to rob it of its best and necessary features. His line of argument briefly reads thus: 1. Drawings and specifications are made in the architect's office under high pressure and there result inconsistencies, ambiguity, and omissions. 2. The time of bidding is too short and quantity-taking by the contractor is carried on with difficulty and uncertainty. 3. A stringent contract, wherein the architect is sole interpreter of the plans and arbiter in case of disputes, binds all parties to an agreement that is likely to work injustice. 4. That where one contractor among ten bidding is successful, the owner assumes the overhead charge of the successful contractor for his percentage loss on unsuccessful bidding.

Then, as a corrective measure, he proposes the English Quantity System of Estimating "with variations."

In England the architect designates the quantity surveyor, he is employed by the contractor and the contractor is responsible for the adequacy and correctness of the bill of quantities. Mr. Jones's recommendation is that the owner employ the quantity surveyor and also be responsible for the bill of quantities; further, that the contract be based on the bill of quantities together with the plans and specifications.

The dangers of Mr. Jones's proposal are manifold, and in the matter of contract it would result in endless litigation.

He would base the contract on two instruments, the plans and specifications and the bill of quantities, the two being open to conflict; as one is an interpretation, in different terms, of the other. A great injustice to the owner lies in the provision that he should assume responsibility for the bill of quantities. There are many cases where plans and specifications are adequate; here the owner and architect have performed and completed their service for bid-taking; the contractor should now perform his service, a part of which is to list the material entering into the construction. The most efficient and economical manner of doing this would be for several or all contractors to maintain a central office with an expert to perform this service, and dignify him with the title, Quantity Surveyor.

This English system is a good one and why cloud the

issue and confuse the duties of owner and contractor?

If Mr. Jones would improve the standard of adequacy of the drawings and specifications issuing from the architect's office, let him but give publicity to the fact that in law the architect is responsible for the adequacy of the drawings and specifications for the proper construction of the building. The responsibility would be made more significant if the architect had a written form of contract with the owner, as was the custom of H. H. Richardson, wherein this responsibility was acknowledged.

W. A. GOLDSTEIN,
*Secretary Louisiana Chapter A. I. A.*

*Editors, THE BRICKBUILDER:*

The question of a quantity system of estimating has been thought of for some time and, as the idea has been a rather indefinite one with us, had never been given serious consideration.

It seems that if such a system were adopted, one of the most necessary things would be the licensing not only of the quantity surveyor but also the architect.

My personal observation of plans prepared by men all over the State of Pennsylvania leads me to agree thoroughly with Mr. Jones's opinion as to the woful lack of meaning in the drawings submitted for much of the work. In this connection I may say that hardly fifty per cent of the drawings and specifications submitted are really fit to be considered under any conditions.

The architects' work, in general, will certainly need to be improved very materially if such a system were adopted, although I have no doubt that with its adoption many of the faults which now exist will be corrected to some considerable degree.

It seems to me that the bill of quantities as well as plans and specifications should be the basis of the contract under all conditions. The surveyor should be held responsible for the accuracy of the quantities, with some limitations. Some slight provision, at least, should be made for unforeseen errors, but not for carelessness. I believe in the end a system of this character would be productive of good.

MILLER I. KAST,
*Secretary, Southern Penn. Chapter, A. I. A.*

*Editors, THE BRICKBUILDER:*

Some six years ago an attempt was made to introduce this system in Los Angeles. A firm of quantity surveyors established offices and carried on their practice for a period of six months or so, in accordance with the so-called English system of quantity surveying. The system, however, at the end of that time was abandoned, and the surveyors left our city for good. It developed from the information that I had received from architects, as well as contractors, that the practice of these quantity surveyors had not been carried on in a strictly regular manner, with the result that neither architects nor contractors have since that time been enthusiastic to reintroduce the system.

I fully agree with Mr. Jones, and realize the unfortunate condition of affairs in the average architect's failure to properly coordinate his drawings and specifications, and his awkward attempt to establish his own infallibility by means of the wording of the contract, such a general custom making it impossible to effect any material uplift in the standard of the architect's relations to the owner and the contractor. The great difficulty that presents itself, however, seems to me to be the insurance of the honesty of a quantity surveyor. Mr. Jones suggests standard rules and units for the measurements of the executed work, but even then the possibilities of irregular conduct on the part of the quantity surveyor for the interest of some particular contractor would be difficult to avoid. The Code of Rules as a tentative basis proposed for the working out of an American quantity system is practical and feasible in so far as Rules 2, 3, 4, and 5 are concerned, but I should find Rule 1 exceedingly difficult of enforcement in California.

In giving the various aspects of the operation of the quantity system Mr. Jones presents a good illustration of the law of averages, establishing theoretically that by this system the owner would receive a more favorable bid from the successful contractor, thereby more than compensating him for the payment of the quantity surveyor's fee. In this particular, perhaps, the majority of architects will agree with Mr. Jones. However, I believe that the average owner would not entertain the same confidence in this theory, but count on the contractor's competitive efforts to secure the work to neutralize any "overhead" expenses that might be charged by him.

This question of quantity surveying was brought up for discussion before a regular meeting of our Chapter held on September 10th, 1912, and elicited little or no enthusiasm among the members at that time. Personally, I think the system of quantity surveying, as outlined by Mr. Jones, is a good one, and I should like to see it adopted by architects throughout the country.

FERDINAND PARMENTIER,
*Secretary Southern California Chapter, A. I. A.*

*Editors, THE BRICKBUILDER:*

It would seem to us that the quantity system, if it could be carried out, would be an ideal one, but there are two obstacles that we fear would make its adoption difficult, in this vicinity at least: the question of figuring labor and the attitude of the owner.

Not all the contractors have a system whereby the labor on a certain quantity of material is added to that quantity when it is figured — that is to say, when the labor is put down as so much per thousand bricks, or as so much per cubic yard of concrete. In the case of the contractor, and it is not an uncommon instance hereabouts, who figures a lump sum for labor in addition to his quantities, it seems to us that the element of chance is still left in control of the situation.

As to the owner, he would have to be either forced or educated into accepting the quantity system. Education would be a very long process, and it could only gradually be applied by the architect. Force could be applied only by the contractors in a body, by refusing to figure longer under the old conditions; we hardly think that any one would expect such united action on the part of contractors.

These comments are the result of only the brief study we have been able to give the matter. The objections may not be insurmountable; they may not even be logical; but they would retard in this locality the reform proposed.

NORMAN M. ISHAM, *President,*
JOHN HUTCHINS CADY, *Secretary,*
*Rhode Island Chapter, A. I. A.*

UNION TRUST BUILDING, WINNIPEG, MANITOBA
JOHN D. ATCHISON & CO., ARCHITECTS

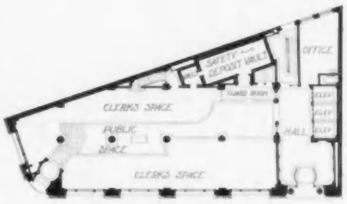
# The Union Trust Building, Winnipeg, Manitoba.

JOHN D. ATCHISON & CO., ARCHITECTS.

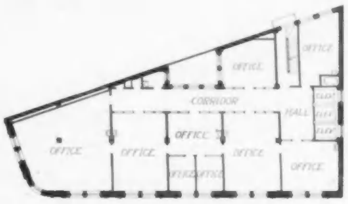
ACCEPTING the conventions for the design of the so-called skyscraper which have been established upon the analogy of the classical column, that is, with a base, a plain shaft and ornamented upper stories and cornice, the designers of the Union Trust Building have applied them to the solution of a problem upon which, from the shape and size of the lot the building was to occupy, were imposed severe and difficult conditions necessitating a wise choice in style and treatment to overcome successfully.

A tall building with a narrow façade is rarely able to command much approval, and where it is adjoined on either side by lower buildings it usually partakes of the nature of an architectural freak, like the tall man at the circus. In this instance, of course, the position on a corner lot is more favorable and the expedient of a well conceived corner treatment is employed to great advantage in that the meager width of the narrow frontage is not unduly emphasized, and viewed from most positions the round corner precludes any tendency to compare the widely differing areas of the two façades.

BANKING ROOM.




FIRST FLOOR PLAN.




TYPICAL FLOOR PLAN.

The building is representative of its type of steel frame construction. The premise that the envelope of masonry which screens the structure is in fact the structure, that the visible base really carries the superincumbent wall and therefore should be more massive, has not been considered in this design. The external indication of the metallic frame is evident and in architectural terra cotta an appropriate material has been frankly used as a facing for the body of the building and for the crowning features where its plastic properties have been properly utilized for the decorative detail.

With the growth of the steel frame building there has been an equally notable improvement in materials suitable for facing the skeleton with an architectural dress. For use under such circumstances where purely structural and load-bearing qualities are not paramount there is no more appropriate or satisfactory material than terra cotta. It is capable of infinite variety of expression from the viewpoint of architectural design, and its light weight together with its acknowledged fireproof properties make it the most logical and practical choice of materials for the modern type of city buildings where these qualities are of the greatest importance.

Progress has a giant's stride and a giant's unconscious brutal contempt for the quiet pace by which achievements of yesterday were attained. The rapid strides in commercialism are nowhere more clearly depicted than in the buildings which house our great business institutions of to-day. There is hardly a city of any size but boasts of its skyscrapers.

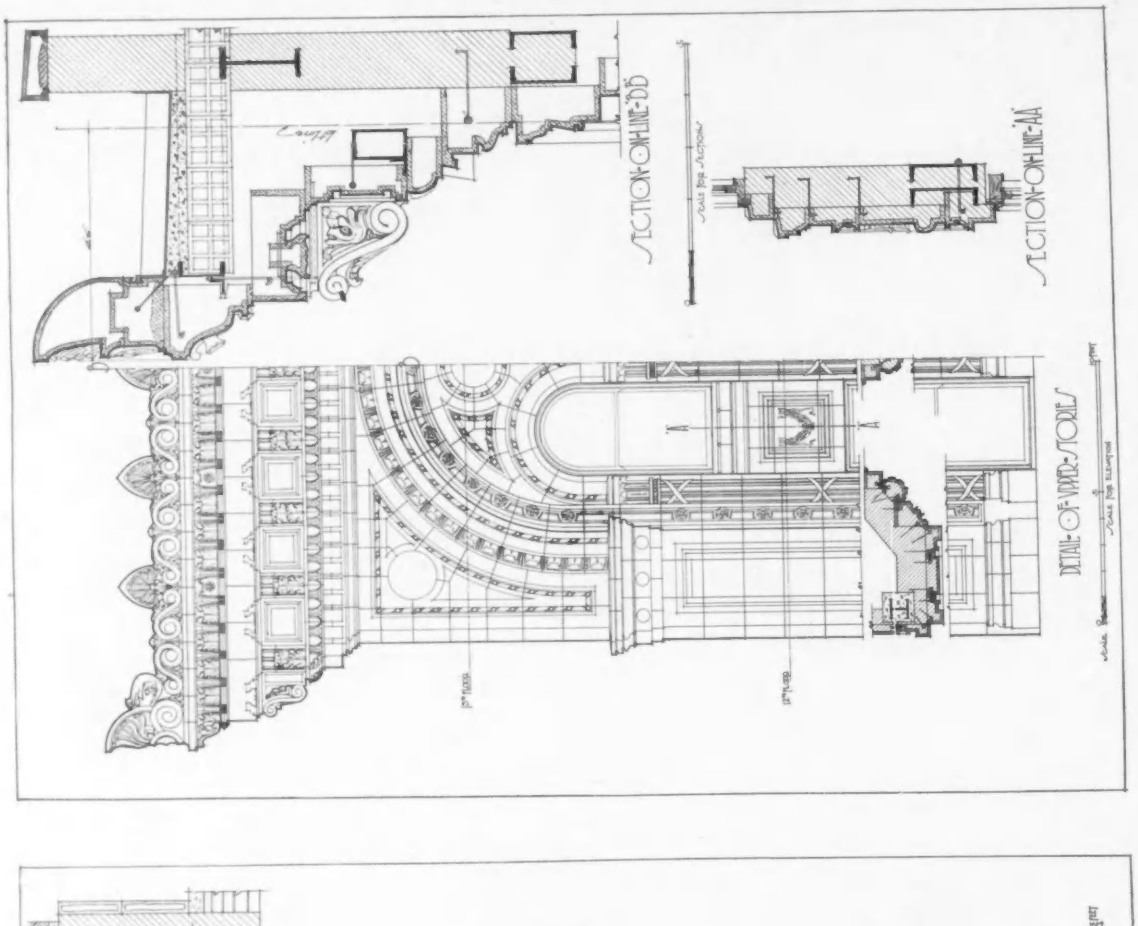
Not many years ago the directors of important banking institutions held themselves aloof from association with the skyscraper, courting dignity and distinction by occupying low buildings designed to express banking characteristics and devoted to nothing but the private business of the bank. The high priced land which they must occupy has, however, turned them from their ways and they are now erecting tall office buildings, with almost the zeal of the real estate promoter, that will pay them in real money good interest on their investment, even if by so doing they sacrifice that elusive quality of dignity which was once considered very essential to their business associations.

This bank and office building presents few features which are not typical of many others of this type of structure. The irregular shape of the lot largely controlled the division of space. The banking room occupies the entire ground floor with the exception of the space necessary at the rear for elevators and an entrance to the offices. The building is fireproof throughout, the floors being of hollow tile flat arch construction and the elevators and stairways enclosed in fireproof enclosures faced with white enamel brick. The foundations are concrete piers carried to rock with an average depth of 65 feet below grade.

The corridors above the first story are finished in marble as well as the entire banking room where Botticini is used for wainscoting, with gray Tennessee marble with a verde border and base for the floor.

The building complete cost 62½ cents per cubic foot. The high cubic price may be accounted for by the irregular shape of the lot, that the corridor on each floor supplies only one set of offices, and the installation of a safe deposit vault and complete mechanical equipment in addition to the liberal use of marble and bronze in the interior finish.

The use of terra cotta for the greater portion of the exterior effected a large saving, but it is interesting to note that although it is counted a less expensive material than stone it is equally appropriate for a building of this character where the interior finish and equipment is of the most elaborate and expensive order.




TERRA COTTA DETAILS, UNION TRUST BUILDING, WINNIPEG, MANITOBA
JOHN D. ATCHISON & CO., ARCHITECTS

# EDITORIAL COMMENT AND NOTES FOR THE MONTH

IT has been a generally accepted opinion that most of the brick buildings of the early days of the Southern colonies were built of brick which had been imported from England or Holland. One has only to turn to any of the authors who have contributed volumes on the subject of colonial architecture to see this statement freely offered.

There has recently come to our notice the report of the proceedings at a meeting of the Columbia Historical Society, held some time ago in Washington, at which Mr. George Alfred Townsend contributed a paper which fully confuted this notion. He was able to bring convincing proof to bear on the subject to which the loyal supporters of the imported brick theory had to give way, and while many expressed a natural regret that one of their cherished beliefs had been dissipated, it was generally thought that the truth of history had been served by Mr. Townsend's research and study.

There has always been a very notable tendency on the part of historical societies and many people interested in early colonial history generally, to attribute to England a share of the honor in building up the social and business interests of the early days of this country, entirely too large in proportion to what is credited the efforts of the colonists themselves. We are glad to see this spirit now giving way to one of more real patriotism; one in which we can recognize the full worth of those humble craftsmen who in their modesty have left but few records beyond the products of their hands by which they might hope to be given the credit to which they are justly due.

One has but to imagine the conditions existing at that period of the world's development to realize that the broad claim that all the bricks used in the southern part of our country before the Revolution were imported from foreign countries, could be founded on nothing but mythology. The small ships of that day were poorly equipped for the storms of the north Atlantic and it is very unlikely they would burden themselves with such a cumbersome cargo as brick, when the crying need of the colonies was for manufactured goods and from which the freight profits must have greatly exceeded any to be possibly derived from the limited cargo of bricks.

William A. Jones, representative in Congress, from the thirteen tidewater counties of Virginia, says in answer to the query:

"I do not know with certainty of any imported brick structure in the first district. The fact has been challenged there as in Maryland. The church of character beyond any colonial church in Virginia is Christ Church, in Lancaster County, built in 1732 by King Carter, the greatest landholder. His constructions were built of native brick, I know, for his descendant has shown me the brick pits. Carter was a model business planter, having his own mills, etc., and not the man to import what he could make."

Still another authority, Mr. Bruce, writing on the economical history of Virginia, declares that all brick used in Virginia in the seventeenth century were manufactured there; that bricklayers and brickmakers arrived in 1607; that in 1622 bricks formed one of the principal articles exported from Virginia to the Bermudas and that in skirmishes with the Indians they were repulsed with brickbats!

It is amusing to think that when bricks could not be purchased in England between 1650 and 1700 for less than eighteen shillings, the planters would have imported them, adding to their cost the transportation across the ocean, to put them to such use as to repulse the Indians.

It is, of course, a matter of record that some brick were imported, but the amount is very small and was in all probability a better grade of brick than could be made here and was consequently used for mantels. There is a record of three importations covering a period of eight years to the province of Maryland, but all told they amount to not over fourteen thousand bricks, and when it is recalled that a single large chimney of those old homesteads would require as many as sixteen thousand, it is clear that this matter of record alone entirely discredits the claim that all the great houses of that vicinity were built of imported brick.

AT Philadelphia on the 25th of October Congress Hall which, through the efforts of the Philadelphia Chapter of the American Institute of Architects, has been restored, was reconsecrated in a manner entirely in keeping with the historical interest which this building possesses. The occasion was honored by the presence of the President of the United States, Speaker of the House, Cabinet officers, members of the Supreme Court, Senators, Congressmen, and foreign Ambassadors. Among the speakers were John Hall Rankin, Frank Miles Day, and Charles A. Ziegler of the Philadelphia Chapter. The committee of the Chapter having this work in charge spared no effort to insure historical accuracy in this work of restoration, and they and the profession at large may well feel gratified at the recognition their work has received at the hands of the officials at Washington.

"ATLANTIC Terra Cotta" is the title of a new publication which will be issued monthly by the Atlantic Terra Cotta Company, 1170 Broadway, New York. It is the purpose of this publication, primarily, to present the interesting work which is being done by the Atlantic Company. The contents will consist largely of illustrations of the highest quality, presented at a scale which will have especial value. The publishers announce that the company will be glad to place any architect, member of an architect's office, or architectural student upon the complimentary mailing list.

FIRE PREVENTION AND FIRE PROTECTION. By Joseph Kendall Freitag, B.S., C.E. Fire protection is one of the most vital business problems of the day. If all the principles set forth so clearly by Mr. Freitag in his book were enforced by all the insurance companies, our loss instead of being $3.60 per capita, as it is in Boston, would drop to less than $1.00 per capita, as it is in many of the foreign cities, and might even go as low as the results accomplished through co-operation by the mill mutual companies; but it is not from the insurance companies that will come the reduction in fire loss. Their function is to equally and equitably distribute the money which the policy holders bet against the chance of fire and it is only by systematic and long continued education of the public that a revision of our present vicious principles of non-fireproof construction can be brought about. Surely no volume has appeared in this country which is so thorough in its presentation of theory of, and so explicit and full in its description of actual practice, as this book of Mr. Freitag's. Nor is it simply the work of one man which he has presented. He has correlated the observations and opinions of the leading experts in many lines, so that while his own investigations are very manifest, he has the backing of the best minds in architecture and engineering to support his deductions. It is a work which no one can afford to ignore. The architect and the engineer will find it indispensable. The general property owner or the tenant, who after all is the one primarily responsible for many bad conditions, should study this work thoroughly to understand how tremendous on the one hand is the annual tribute which this country pays to careless and poor construction, and on the other hand how possible it is to build a modern city so the annual fire loss shall be almost negligible. That this latter statement is not mere theory is abundantly proved by the experiences of nearly every city in other countries than our own. The United States has the distinction of burning up every year about one-half as much as the value of all new constructions; and if the principles which are so well explained in this volume could only be carried out in practice, the cost of necessary building operations could be reduced at least thirty per cent, for that proportion represents about the replacement cost of fire losses which is charged to investment.

The volume is divided into six parts, one covering the general subject of fire prevention and fire protection, another on tests and materials, two excellent parts on design and construction, a part devoted to special types of buildings, theaters, schools, residences, factories, garages, safes and special hazards, and a final chapter on the auxiliary equipment and safeguards which go such a long ways towards offsetting the deliberate carelessness of tenants and the short-sighted economy of property owners; such as sprinklers, automatic alarms, watch-clocks, etc. The meat of the volume from the standpoint of the architect and the engineer is in parts three and four, dealing entirely with fire-resisting design and fire-resisting construction, and the whole subject is worked out most carefully and with painstaking consideration of all details.

There are some points we would like to see different in subsequent editions. In dealing with special classes of risks, a little too much insistence is placed upon some matters which are not wholly questions of fire hazard, and to advantage the last two parts could be materially reduced in scope with a gain in the compactness of the volume; but to find fault with the details of this work is an invidious task which is not necessary, having in mind the extreme general excellence of the whole program and the masterly way in which it has been handled, free from the bias of either the professional engineer or the practical contractor. It is a distinct addition to our constructive literature. Price, $4.00. New York, John Wiley & Sons, Inc.

IN this issue we present four plates of two interesting library buildings which illustrate the more usual types of such a building. There is perhaps no more hackneyed problem than the small library building. Hundreds have been designed in the United States during the last few years, and they have, in consequence, resolved themselves into a type which comes pretty near to perfection, so far as the plan is concerned; and as most of them include one large room only in the main building, the expression of the interior, in the majority of cases, is indicated on the exterior by three or five openings with some sort of columnar treatment for the main entrance.

A marked departure from these generally accepted principles is strongly evident in Mr. Kelsey's design. Apparently he first designed a straight façade with five openings of equal size, then to discount the loss of light from an overhanging monumental central feature, as well as from the inclusion of a doorway there, he made the central opening wider than those on either side, and extended it to the floor level; adding a monumental portico with a warped arch larger than the opening behind — thereby concentrating all interest on this feature. The treatment of the wall surfaces and window openings on either side of the entrance feature have been purposely kept very simple and the dull drab tone of the walls and cornice was elected to make even more vivid the contrast of the open portico, finished in lustrous glazed terra cotta.

In the treatment of the frieze and under the arch he has given a touch of ornament to signify the use of the building. In the rustications at regular intervals there are conventionalized blocks ornamented with old looking volumes in low relief. Thus a sort of diaper pattern forms the field over which a rich tracery is carried with deeply coffered panels around a central rosette, all forming the vault overhead. At night the lighting will bring out the brilliance of this polychrome work to immense advantage.

The second library building illustrated is located at Yale University and serves to house its library relating to Foreign Missions, which is incidentally one of the largest, if not the largest, existing on this subject. The building was designed to form the side of the quadrangle or close made by the existing buildings of the Divinity Schools. It is connected with East and West Divinity Halls by open vaulted arcades, giving on to the quadrangle.

The exterior of the building is of local red New Haven brick. All the decorative as well as the constructive features have been made of this material, including all mouldings, window reveals and mullions, finials and copings.

It is a fine example of simple English Gothic carried out entirely in brick, and when the approaches and planting are completed it will express much of that charm which we associate with the collegiate Gothic of England.